THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (12 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad .....£2 5s. 0d.
Single Copies .....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 86 NO. 14 FRIDAY, APRIL 18, 1947

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THE RAILWAY GAZETTE
33, TOTHILL STREET, WESTMINSTER, S.W.1.

Mr. Dalton's Third Budget

THERE had been general expectation that Mr. Dalton would frame his Budget on Socialistic lines, and the manner in which he played to the masses, both in the House of Commons and in his broadcast speech, occasioned little surprise. Political capital obviously can be made from such additional imposts as are borne by the succession duties, stamp duties, and the new tax on the issue of bonus shares; it may be said that the additional tax on distributable profits of companies was not as heavy as many had feared. The 50 per cent. increase in the tobacco duty is undoubtedly the most unpopular feature of the Budget, and in most cases will offset the additional income tax allowances. It may also antagonise productive workers, and if so, it will achieve an effect opposite to the "incentives" for which many had hoped in the Budget. There is nothing in it to encourage enterprise either individual or corporate. Any satisfaction which Mr. Dalton may feel in his prospective £269,000,000 surplus will not be shared by those who realise how it has been swept together.

* * * *

Great Britain as a Tourist Centre

Last week-end, there was some controversy as to the desirability of endeavouring to attract tourists to Great Britain this year. The Automobile Association urged the Government to modify its plans to bring 150,000 tourists to the country, and said that for every visitor, a Briton would have to give up his holiday accommodation. The Caterers' Association suggested that it would be better to defer seeking tourists, because of the difficulties of making suitable provision for them. Sir Alexander Maxwell, Chairman of the Government-sponsored British Tourist Board, deplored advice to visitors to stay away when the Government had decided that it was essential to encourage them. Our own view remains as expressed in our December 28, 1945, issue, when we pointed out that the amenities which Great Britain can offer the tourist are so poor that the effect might be the reverse to that intended. Several years must elapse before the deficiencies in hotel accommodation, catering services, and other amenities can be made good. At present there is a shortage of hotel rooms in London alone, running into many thousands, and the food and drink situation in this country is not such as to be attractive to overseas visitors.

* * * *

Industrial Research in Technical Colleges

The Federation of British Industries has circulated a report on "Industrial Research in Technical Colleges," made by a sub-committee under the Chairmanship of Sir Robert Pickard, F.R.S., D.Sc., who was recently director of the British Cotton Industry Research Association. The remit to the sub-committee directed it to report on co-operation by industry with the senior technical colleges. The response is to the effect that there is a positive part that industry can play in the success of the research work of the technical colleges, which, in turn, will redound to industry's own benefit. The report accordingly recommends that industrial concerns with their own research departments should place inquiries with their local technical college, consulting freely with the college and providing financial help and equipment when required. We agree that nothing but good can come from developing the closest possible relations, and consider that the report is right in recommending that trade associations should assist in maintaining contact. Obviously, the Industrial Research Secretariat of the F.B.I. can do good work as a clearing house for keeping firms and colleges in touch. It is to be hoped that all industries likely to benefit from research activities will adopt the report's recommendations unreservedly.

* * * *

Government Disposal of Rolling Stock

In view of the present acute need for locomotives on the home railways, it is a little surprising to learn from *The Board of Trade Journal* that the Railway Section of the Directorate of R.E. Disposals, Ministry of Supply, has on offer various types of locomotives and rolling stock for both standard and 2 ft. 6-in. gauge railways. The main-line locomotives

are the 2-10-0 type which were built during 1943-45, by the North British Locomotive Co. Ltd. for the War Department. They were designed for working heavy freight trains on railways where the maximum permissible axle loading was 13½ tons. It is stated that in no case has the mileage of the locomotives on offer exceeded 35,000, and they are at present located at the Military Depot, Longmoor. The shunters are mainly standard 0-6-0 side tank locomotives built in America during 1942-44. Some of these locomotives have been sold to the Southern Railway, the Coal Board, and Yugoslavia. The remainder are at the Ministry of Supply Depot at Newbury Racecourse. The 2 ft. 6-in.gauge railway equipment is of German manufacture, and formed part of cargoes removed from captured German vessels.

* * * *

Overseas Railway Traffics

Recent tendencies towards lower receipts on Argentine railways continued in the fortnight ended April 5, but were accounted for in part by three days of rain and the beginning of the Easter holiday in the second week. Decreases in both weeks totalled ps. 815,000 on the Buenos Ayres Great Southern, and ps. 49,600 on the Central Argentine. Entre Rios results were well maintained for the first seven days, but fell by ps. 23,100 in the second week. On the other hand, both weeks showed improvements on the Argentine North Eastern, Buenos Ayres & Pacific, and Buenos Ayres Western, the gains totalling ps. 127,000, ps. 1,011,000, and ps. 526,000 respectively. Some results are compared in the table below:—

	No. of week	Weekly traffic	Inc. or dec.	Aggregate traffic	Inc. or dec.
Buenos Ayres & Pacific*	40	2,970	+513	95,127	+4,066
Buenos Ayres Great Southern*...	40	3,761	−741	145,557	+2,525
Buenos Ayres Western*	40	1,363	+132	52,511	+4,428
Central Argentine*	40	3,371	− 24	129,262	+2,841
		£	£	£	£
Canadian Pacific	13	2,326,250	+349,250	17,837,250	+ 47,000

* Traffic returns in thousands of pesos

A traffic return for February issued by the C.P.R. shows a decrease of £390,500 in gross earnings, accompanied by a rise of £206,000 in working expenses, which resulted in net earnings showing a deficit of £256,500.

* * * *

British Railway Investments in Chile

To 1930, British capital invested in Chile for many years had received a satisfactory return—generally about 5 per cent., but sometimes much higher during periods when the fluctuating nitrate industry was enjoying prosperity. Since 1931, however, average as well as individual payments have been meagre. In 1946 the total amount of British capital invested in Chile, according to statistics compiled by *The South American Journal*, was £49,207,126, or little different from the £49,518,496 of the year before. The interest received was £836,043, or 1·7 per cent., which was an improvement on the £734,278, or 1·4 per cent., for 1945. The amount receiving no interest was £10,267,834, which compared with £11,977,844. British investment in Chilean railways in 1946 was £16,337,708, compared with £16,485,158 in 1945. Interest received was £214,245, or 1·3 per cent., against £177,488, or 1 per cent., and the improvement was due almost entirely to the payment on account of preference arrears by the Antofagasta, Chili & Bolivia Railway. The amount of railway capital receiving no interest last year was £7,615,334, in comparison with £9,615,344 for 1945.

* * * *

Allocation of Railway Revenues in India

In the light of prospective nationalisation of transport in this country, it is interesting to recall some of the clauses of the Indian convention of 1943, separating railway from general finances, and treating the railways of that country virtually as nationalised. They stipulate that the general revenues shall receive a definite annual contribution from railways, which shall be the first charge on their net receipts. This contribution, based on capital at charge and working results, shall be 1 per cent. on the capital at the end of the penultimate financial year, plus one-fifth of any surplus profits remaining after payment of this fixed return, subject to the provision that if in any year revenues cannot provide the 1 per cent., surplus profits in the next or subsequent years will not be deemed to have accrued for purposes of division until such deficiency has been made good. Any surplus remaining after the payment to general revenues shall be transferred to a railway reserve, provided that, if the sum available for transfer to the reserve in any year exceeds Rs. 3 crores (£2¼ million), only two-thirds of the excess over that figure shall be so transferred, the remaining one-third to accrue to general revenues. The railway reserve shall be used to secure the payment of annual contributions to general revenues, to provide for arrears of depreciation, when necessary, and for writing down or writing off capital and to strengthen the financial position of railways so that services rendered to the public may be improved and rates may be reduced.

* * * *

A Permanent Engineering Exhibition

For a long time there has been a real need for some kind of permanent exhibition of engineering products, so that manufacturers and industrial consultants can keep abreast of current developments without the embarrassment of salesmanship in any active form. This need will be met during the coming summer by the establishment at Glasgow of The Engineering Centre, details of which are given elsewhere in this issue, which already has the support of 40 technical institutions and more than 100 firms. The essence of the centre will be to provide opportunities for visual study of the latest mechanical equipment and processes. It will be by resolutely subordinating salesmanship to information that the centre expects to build up a regular following among consulting and industrial engineers, local authorities, and foreign buyers, and one of the main features of the service will be an advisory bureau staffed by technical experts whose duty it will be to provide factual information free of charge. The exhibits, which will be changed regularly, will comprise appliances, machinery, tools, materials, etc., from all parts of the world, although at all times preference will be given to manufacturers within the British Empire.

* * * *

British Locomotive Building Industry

In our issue of April 4 we were able to give some details of a survey which has been conducted by Political & Economic Planning relating to the British locomotive manufacturing industry. This survey now has been published as a broadsheet, and brief reference to it is made in our "Publications Received" columns. These broadsheets issued by P.E.P. enjoy a high reputation for the care with which they are compiled and the details which they give. The present example is no exception to this rule. We dealt at some length with the position of the British locomotive manufacturing industry in our April 4 issue, but not the least interesting aspect of the survey now published is that relating to the foreign locomotive building industries. This brings out quite clearly the disadvantage suffered by the British industry, for it is shown that in most cases the principal foreign builders have the advantage of considerable home orders.

* * * *

Road-Bed Grouting with Cement and Cement-Asphalt

In somewhat unusual circumstances, pressure grouting was used to stabilise the permanent way in No. 2 Tunnel on the Edgewood line of the Illinois Central Railroad. In this tunnel, which was completed in 1928, the gravel and crushed stone ballast rests directly on a shale subsoil, and for about 10 years no particular difficulty was experienced. Then, however, the ballast became very foul. It was entirely renewed, but quickly deteriorated under heavy war traffic, until the ballast exuded thousands of "mud boils" up to 6 in. and 8 in. high, so saturated was it with what proved to be a slurry of powdered shale and water; obviously, this had been drawn up from the subsoil by capillary action. Accordingly, an aggregate length of 3,215 ft. was pressure-grouted with 6,136 batches of a mixture having a richness of one sack of cement to 10 gal. of water, until the grout appeared on the surface of the ballast. Into some grout holes the mixture was easily forced, but into others none could be introduced, though pressures up to 300 lb. per sq. in. were used. The application was, however, quite successful in preventing the ballast fouling, and it was found that the fissures in the shale had been sealed

to 6-in. or 8-in. depth. Elsewhere in America, emulsified asphalt is being mixed with the cement "mix," making the grout flow more easily and assuring deep penetration and sealing, and enabling a leaner cement mixture to be used.

* * * *

L.N.E.R. to Build New Woodhead Tunnel

After nearly eight months of continuous repair work, normal double-line traffic was resumed through Woodhead Tunnel, on the L.N.E.R. Manchester-Sheffield main line, on April 9. Considerable arrears of maintenance had to be made good at the end of the war, such work having been reduced to the practicable minimum to avoid interruption to trains carrying war supplies. When extensive repairs, such as the relining just completed, have to be carried out, it is necessary for the bore being dealt with to be closed to traffic, so that only one track is available through the three-mile tunnel section. The company is advised that much additional work would be necessary to put the tunnels into fully satisfactory condition, and this again would involve a "bottleneck" for lengthy periods between Manchester and Sheffield. In consequence, the directors of the L.N.E.R. have applied for Parliamentary powers to drive an entirely new double-line tunnel, parallel with the existing tunnels. The first tunnel, at Woodhead, which accommodated a single line only, was begun in 1838 and opened for public traffic on December 23, 1845. The second tunnel was begun in 1847 and completed in 1852.

* * * *

Electrical Timing Circuits

Mr. H. J. N. Riddle's paper, "Electrical Timing Circuits," which was read on February 3 before the Institution of Railway Signal Engineers, necessarily dealt with many matters not at present immediately related to railway signalling. Timed controls find a limited place in railway signalling chiefly in connection with certain arrangements of electric locking circuits, for which various designs of relay, clockwork, and other mechanisms have been used. Some of the circuit schemes described by Mr. Riddle also have been applied, we believe, to some extent. The paper nevertheless was listened to with much interest, and provoked a lively discussion among a few engineers having particular experience of the methods described and, as it appeared, decided opinions on the merits and disadvantages of each. The signal engineer, responsible for the correct working of equipment directly associated with the safety of the travelling public, is diffident of using methods which may be perfectly satisfactory for other work, where also facilities for maintenance may be different and the closed-circuit principle not of fundamental importance.

* * * *

The Derailment at Marshmoor, L.N.E.R.

Lt.-Colonel G. R. S. Wilson's report on the derailment on November 10, 1946, near Marshmoor signal box, L.N.E.R., of which we publish a summary on page 397, shows that it occurred at a place where line and level had called for constant attention of recent years. Drainage works, there and elsewhere, had to be postponed during the war, and the speed restriction of 60 m.p.h. then generally imposed had been retained at Marshmoor. Such works actually were in progress at the site on the day of the accident. Although the engineers were quite satisfied as to the condition of the up main line on ceasing work on the down main in the afternoon, it deteriorated rapidly during the evening, and several trains before the derailed one experienced lurching. This accident, as did that at Hatfield on July 15, 1946, drew attention to the behaviour of the "V2" class 2-6-2 engines under irregularities of alignment and cross-level. Experiments are being made, after Colonel Wilson's recommendations in the Hatfield case, with a spring-controlled pony truck in place of the present swing link design, in an endeavour to improve the riding qualities. One engine has been altered, and equipment for 25 more is on order. New Pacific type engines now building will enable a number of "V2" locomotives to be released from express passenger work. It is not possible at present to discontinue their use on such trains, and "the position is being dealt with by a more rigorous policy of local speed restriction, after a close review of the more troublesome sections of the track," the weak points in which "are largely the result of arrears of maintenance during the war."

Captain B. H. Peter

THE approaching retirement of Captain B. H. Peter, C.B.E., from the Westinghouse Brake & Signal Co. Ltd., announced in our issue of April 4, recalls some of the landmarks in power signalling. Captain Peter, of whom a portrait and biography appear on another page, retires next September; he relinquished last month the Managing Directorship, and has become Deputy-Chairman. When he joined the Metropolitan District Railway in 1903 the planning of the signalling to be applied in connection with its electrification was commencing, and with it a most interesting period of signalling development in this country. He was responsible for bringing into service, on June 5, 1905, the first illuminated track diagram to be installed anywhere in the world, at Mill Hill Park, as part of the first electro-pneumatic interlocking on any of the London Underground lines. Captain Peter was the inventor of the resonated impedance bond, and of the condenser-fed track circuit—both important factors for the improvement of track circuit performance under difficult conditions. Later, as Chief Engineer of the McKenzie, Holland & Westinghouse Power Signal Co. Ltd., he was responsible for bringing into service the first installation of day colour light signals in this country, on the Liverpool Overhead Railway in 1921. In more recent times, his securing for Westinghouse of the famous £5¾ million contract for air brakes on the Polish State Railways was a triumph, not only for his company, but for British industry generally in the face of intense competition from Germany. This was succeeded by his introduction of the Westinghouse air brake to Lithuania.

In the many years during which Captain Peter has been such a well-known and respected figure in our signalling and brake industry and its associates, he has travelled widely and done much to establish and enhance the high credit it enjoys in all parts of the world. His services to that industry as Chairman of its Export & Industrial Group have been of lasting benefit.

* * * *

Lewis Cecil Geach

MR. LEWIS CECIL GEACH, whose death, at the age of 73, we recorded briefly last week, was Superintendent of Motive Power, Midland Railway, from the creation of that post in 1910 until the amalgamation in 1923, and then was Superintendent of Motive Power, Midland Division, L.M.S.R., until his retirement in 1927. His early training was with the Hydraulic Engineering Company at Chester, and he joined the service of the Midland Railway on January 3, 1896, as a draughtsman. He subsequently occupied positions as locomotive foreman at Bromsgrove; and District Locomotive Superintendent's Assistant at Bristol, Kentish Town, and Canklow. He was appointed District Locomotive Superintendent at Burton in April, 1905; and was removed to Derby in a similar position in December, 1906.

In April, 1907, he was appointed Running Superintendent, and in January, 1910, became Superintendent of Motive Power at Derby. He was the first holder of that position, under Mr. (afterwards Sir) Cecil Paget's reorganisation of what later became the operating department, and handled the engines, after the retirement of the last Midland Superintendent of the Line. As Running Superintendent, Geach had charge of the Locomotive Train Office, where Paget was then experimenting with various ideas for the diagramming of engine workings, and supervised the fixing of point-to-point running times for the various classes of engines according to tonnage hauled—two of Paget's innovations which did much to enable the Midland Railway to work its services so satisfactorily with a comparatively small stud of express passenger engines.

Geach was not popular, and he had a very difficult task in transferring to the locomotive side at Derby as the first of the new type of officer introduced by Paget, and was hampered by a rather superior and supercilious manner, which did not endear him to the old Midland type around Paget, and made his task very difficult. He did not get on too well with Follows, and retired from the service—in 1927—as soon as he could. The Locomotive Train Office which Paget afterwards amalgamated with the timetable train office under his own supervision, was used before 1910 as the trying-out ground for many of Paget's ideas, and Geach had much to do with it.

XUM

Selling Freight Transport

DURING the war years, American railways remained in private ownership, but had no need to seek traffic as both freight and passenger carryings reached all-time high levels. Now, with the total volume of transport declining, the railways are once more competing keenly with road, water, and air rivals. The Pennsylvania Railroad, which always does things systematically, has published a study* of freight transport sales to serve as a text for group meetings of its sales force where plans for securing business are considered and schemes for keeping on good terms with the public are discussed. The booklet, written by Mr. Ralph W. Cooke, analyses the factors that influence the struggle for merchandise traffic in the Pennsylvania's territory in which nearly 50 per cent. of the U.S.A. people dwell. A British railway would have called a pamphlet of this kind "Canvassing for Merchandise Traffic" and would have circulated it among the goods and mineral canvassers. Once upon a time Americans spoke of traffic solicitors, but now prefer the term "salesmen."

The booklet begins with an account of the Pennsylvania's status as a public carrier and of the responsibilities discharged by its freight traffic department. A review of the sources of freight business follows, leading to an enumeration of the qualities which make for success in securing tonnage to the Pennsylvania's routes. Stress is laid on the duty of salesmen to watch the general interests of their company by keeping in touch not only with their superior officers, but with associates in other railway departments. Suggestions are thrown out for organising sales work and recording results. Then comes a chapter containing hints on interviewing customers. These precepts are framed in somewhat abstract style and do not always state clearly "the know how." What is a salesman to make of advice to accept failures in a sportsmanlike manner and "develop a sales technique which will ensure greater future success"? Surely all he can do is to try another tack and hope for the best.

A perusal of the American booklet left us wondering what scope will exist for traffic canvassers in this country, if transport is nationalised next year. Will some variety of planning, or allocation of traffic, replace competition as we knew it before the war? If the new railway organisation is to remain vitalised and aggressive, development sections and industrial agencies must play a big part in the Goods and Mineral Departments. There will still be a wide field for "the superior sales rating"—to use Mr. R. W. Cooke's phrase—of railway commercial staff possessed of ideas, drive, and determination.

* * * *

"London Transport Carried On"

FOR many Londoners their earliest recollections of events in the recent war are of the days in the summer of 1939, when certain tube stations on the London Transport system were closed for the carrying out of unspecified works. It is now well known that these works were the provision of floodgates at the ends of sections of line which passed under the River Thames, as a precaution against inundation of the tunnels as a result of bombing. This was the first manifestation to the public of precautionary measures taken by the London Passenger Transport Board which began as early as 1937, when an A.R.P. committee was appointed. The board has now published an illustrated book entitled "London Transport Carried On," in which Mr. Charles Graves tells the story of wartime activities and adventures of its surface and underground transport, from the outbreak of war until VE-Day.

Many of the events in London during those years will long be recalled by historians of the war, but others are tending already to be forgotten, such as the days when London Transport took to the River Thames to provide a service of boats between Westminster and Woolwich after particularly heavy damage to land transport facilities. Among the many illustrations throughout the book are two which recall that episode, one showing a steamer leaving Westminster Pier, and the other the familiar figure of a bus conductor collecting fares on deck. Mr. Graves amplifies his own graphic descriptions of bomb incidents with many personal narratives by eye witnesses. Many readers will find in his pages the first detailed accounts they have read of such now historic incidents as the bomb on the roadway above the Bank Station. Blast travelled down the escalator shafts and blew the driver's hands off the controls of the train which was just entering. The train stopped automatically, but not before some people were blown off the platform by the blast and run over. This is but one of the many detailed sidelights on such happenings that Mr. Graves presents. At one time the "business as usual" attitude was decried as unsuited to the circumstances of totalitarian war, but it is a habit of mind deeply ingrained in the British character. In consequence, such events as the partial disappearance of a bus into a bomb crater, or the conduct of rush-hour traffic amid the crowds who sheltered in the tube stations, were regarded as an inevitable part of the daily round, and are related in this book with a simplicity of statement that now adds to their dramatic value.

* * * *

L.M.S.R. General-Purpose Locomotives

WE publish elsewhere in this issue a review of the position regarding the standardisation of locomotive types on the L.M.S.R. It is stated that the whole of the traffic requirements on the L.M.S.R. now can be covered by eleven locomotive classes. For express passenger services, there are two standard locomotives, the latest non-streamline Pacific and the re-boilered "Royal Scot." The 5xP no longer appears as a standard type, but all engines of this class, presumably, will be fitted eventually with the new "Royal Scot" type of boiler, so that they will then, in effect, form part of the same class as the re-built "Royal Scots." For mixed traffic and heavy freight working, respectively, there are the obvious choices of the Class "5" 4-6-0 and Class "8" 2-8-0, both of which have been built in large numbers in recent years.

For light freight and secondary passenger services, there are two types of 2-cylinder 2-6-0 engine. The larger of the two, Class "4," is yet to appear, but the first of the Class "2" 2-6-0 engines have been completed, and were described in *The Railway Gazette* of January 3, 1947. The introduction of the 2-6-0 type for secondary duties in place of the 0-6-0 is an interesting development, and reflects the tendency at the present time to design general-purpose locomotives capable of operating a wide range of traffic. There are to be four standard types of tank engine, Class "4" 2-6-4 two-cylinder mixed-traffic type, the new Class "2" 2-6-2, the older 0-6-0 shunting engine, and the small 0-6-0 dockyard shunter. Ten classes of steam locomotive are thus accounted for, and the remaining standard locomotive type is the 0-6-0 diesel shunter.

The change in locomotive policy which has taken place during the past 25 years is shown clearly by the fact that the 4-4-0 passenger and 0-6-0 freight types, with which practically the whole of the traffic of the former Midland Railway was worked, are no longer regarded as being suitable for modern requirements, even on secondary services. It will, of course, be many years before all non-standard 4-4-0 and 0-6-0 engines are withdrawn from service, since many of them are of relatively recent construction, but, provided the present locomotive policy is continued, they will be replaced gradually by the more modern general purpose mixed-traffic locomotives of the 4-6-0 and 2-6-0 wheel arrangement.

* * * *

Canadian Pacific Railway Company

A SHARP drop in passenger revenue on the Canadian Pacific Railway during 1946, accompanied by smaller receipts from sleeping, dining car, and associated services, was the major factor contributing to a decline of $23,613,530 in gross receipts. Passenger earnings fell principally on account of the disappearance of military traffic, for civilian travel was at a high level. During the year the repatriation of Canadian Service personnel, and the movement of their dependants to Canada, were all but completed. Total freight earnings were 4 per cent. lower than in 1945, although, if grain traffic is excluded, increases in the tonnage of coal, paper and other commodities resulted in the earnings under those heads being 3·2 per cent. higher than in the previous year. The grain handlings on the company's Western Lines were 116 million bushels less than in 1945, for as a result of the early cessation

* "Freight Transportation Sales." A study by Ralph W. Cooke. The Pennsylvania Railroad, Philadelphia, U.S.A.

of the relatively meagre supplies of wheat provided by the 1945 crop, it was not until the 1946 crop had been harvested that a large volume of wheat became available for movement. Although gross earnings decreased by 7·5 per cent. from 1945, they have been exceeded only three times previously, in 1943, 1944, and 1945.

Working expenses decreased by $8,402,246, or 3 per cent. Expenses for material and supplies, taxes, and other items decreased by $15,683,442, but wage increases totalling 10 cents an hour awarded to all employees during the year, added approximately $8,700,000 to expenses. The operating ratio was the highest on record, with expenses absorbing 93 cents of every dollar earned for railway service. Maintenance expenses represented 37 per cent. of gross earnings, the same as in the previous year. At the end of the year, 91·6 per cent. of locomotives and 97·8 per cent. of freight rolling stock were in serviceable condition, compared with 90·9 per cent., and 97·4 per cent. respectively at the end of 1945. The net earnings for railway operation amounted to $20,843,050, a decrease of $15,211,284, or 42·2 per cent. from 1945. They represented only 7 per cent. of gross earnings, compared with 11 per cent. in 1945, 14 per cent. in 1944, and an average of 18 per cent. in the decade prior to the war. Some results are:—

	1945	1946
	$	$
Passenger revenue	56,854,297	45,380,645
Freight revenue	227,707,486	218,550,608
Miscellaneous	31,547,575	28,564,575
Gross revenue	316,109,358	292,495,828
Working expenses (including taxes)	280,055,024	271,652,778
Net earnings	36,054,334	20,843,050
Other income	15,106,957	22,779,794
Fixed charges	19,547,129	18,488,113
Net income	31,614,162	25,134,731
Dividends	21,781,500	21,307,682
Balance	9,832,662	3,827,049
	%	%
Operating ratio	88·59	92·87

Other income amounted to $22,779,794, an increase of $7,672,837. Increases were shown in the net earnings of ocean and coastal steamships, and from hotels. Hotels which were closed during the war enjoyed the largest trade in their history when they reopened. Communications Department net earnings fell by $214,671, wholly on account of increased wage rates. Total net income for the year was $25,134,731, from which dividends aggregating $21,307,682 were declared. A dividend of $2·5 per share was declared on the capital stock of the Minneapolis, St. Paul & Sault St. Marie Railroad Company, on which gross earnings amounted to $27,970,148, a decrease of $575,382.

Improvements in service to the public are being pursued actively, and a system of co-ordinated rail and lorry transport in certain areas of Western Canada is being extended. The company installed automatic block signals on a further 242 miles of single track. Among the 36 Pacific-type locomotives placed in service during the year, two were equipped with all-welded, instead of riveted, boilers, and were the first Canadian locomotives to adopt this form of construction. Other new equipment included 14 diesel shunting locomotives, 623 box wagons, and 395 50-ton refrigerator wagons. Five new vessels were added to the company's ocean fleet, and contributed materially to the increase in earnings from steamship services.

* * * *

The Eastern Union Railway

THE county of Suffolk attracted the attention of railway promoters at a very early date, and in 1826 a scheme was launched for building a railway or tramway, to be known as the Port of Ipswich & Suffolk Railway, from Ipswich to the market town of Eye, *via* Debenham. The scheme failed on the grounds that it would interfere with existing road and sea transport, and that the promoters had no connection with the district. Other abortive schemes for providing the district with railways followed during the next few years, and it was not until 1836 that the Eastern Counties Railway was authorised from London to Yarmouth, *via* Chelmsford, Colchester, Ipswich, and Norwich. Financial difficulties prevented the construction of this line beyond Colchester, although the company established a route between London and Norwich and Yarmouth by leasing the Northern & Eastern Railway, and extending it to join the Norfolk Railway at Brandon.

The story of the Eastern Union Railway, which bridged the gap between Colchester and Norwich, is one of local enterprise, and has been told* to commemorate the centenary of opening. The railway was authorised from Colchester to Ipswich on July 19, 1844, and opened to public traffic on June 15, 1846. An associated undertaking, the Ipswich & Bury St. Edmunds Railway, was authorised shortly afterwards, and opened on December 7, 1846, and the route to Norwich was completed by an extension of the Eastern Union Railway, opened on December 12, 1849. The working history of the railway reached its final stage on January 1, 1854, when arrangements were made for it to be worked by the Eastern Counties Railway. On July 1, 1862, it was amalgamated with the Eastern Counties Railway, and other lines, to form the Great Eastern Railway.

To preserve the amenities of the picturesque district served by the Eastern Union Railway and its associated lines, graceful and well-proportioned designs were adopted for bridges, and considerable expense was incurred in providing artistic station buildings, several of which still survive. It is also worthy of note that subways or footbridges were provided at certain roadside stations at the time of their construction, a most unusual safety precaution in those early days. The L.N.E.R. is to be congratulated on its enterprise in fostering local patriotism by the production of this attractive brochure.

* * * *

Plain English

IT is refreshing to find a busy railwaymen taking thought about the literary style of documents needed for the conduct of day-to-day business. Mr. M. A. Cameron, Assistant Passenger Manager, Southern Area, L.N.E.R., has written a booklet† which suggests simple rules for writing letters, memoranda, and reports in plain English. He advises the writers to be (1) brief, (2) appropriate, (3) direct, (4) clear, (5) accurate, and (6) neat. In amplifying these rules, Mr. Cameron takes much the same line as the Scottish Advisory Council on Education in its recent report on Primary Education. The Council said that a good business letter "should be clear and concise, careful in spelling, grammar and punctuation, simple and unpretentious in language." The Council added that "there should be no such thing as business English ('re yours of even date to hand')"; and that "the safest and most sensible way to mention a date is not to use "ult." or "curt." or "inst." or "prox.," but to write down the date." Mr. Cameron shares these views and gives another good hint that, in a long draft, it often helps to number the paragraphs.

Two of the six chapters in the booklet aim at giving guidance in the preparation of memoranda, minutes and reports. These, we think, will be helpful to young railwaymen, but we are not so clear about the chapter headed "Learning by Example." This phrase means, according to Mr. Cameron, reading with ears and eyes wide open. He recommends Rudyard Kipling, R. L. Stevenson, and J. B. Priestley as examples to study, quoting extracts which many people would regard as samples of precious phrasing, hardly fit for the writers of plain English to imitate. Has Mr. Cameron forgotten that Lord Grey of Fallodon, who sat on the L.N.E.R. board from 1923 to 1933, was a master of direct speech, with a talent for summing up a complicated case in one or two terse phrases? In Lord Grey's "Twenty Five Years," the characteristics of railway administration forty years ago are described once for all in simple terms, and is there any English to equal the plain words of the Fallodon Papers—above all, of the essay on Recreation? These papers are good talk, unspoiled by literary flourishes or straining after effect. They are a safe example for those who value the dignity of words, as are the writings of John, Viscount Morley, and some of the best journalism of the present day. May we be pardoned for adding that *The Railway Gazette* avoids consistently any attempt at fine writing in its articles, preferring to keep to plain English which he who runs may read? We hope Mr. Cameron's booklet will have a wide circulation, for we admire his eagerness to help the young writer to find a clear style of his own and to shun the Civil Service habit of using abstract terms.

* "The Eastern Union Railway." By F. Hilton. London: London & North Eastern Railway, Dorset Square, N.W.1. 8¼ in. × 5¼ in. 42 pp. + map, gradient sections, locomotive chart, and early timetable. Fully illustrated. Paper covers. Price 2s. 6d.

† "Plain English." By M. A. Cameron, M.A. Transportation Press Limited, Tudor Chambers, London, N.22. Price 1s. 6d.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Waterloo-Exeter Runs

60a, Green Lane,
Northwood. April 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the notes in "The Scrap Heap" page of your issue of April 4, on the trial trip schedule of the L. & S.W.R. run from Waterloo to Exeter on May 13, 1883, you mention June, 1903, as the first year of a regular non-stop run between Salisbury and Exeter. As a matter of fact, July 1, 1900, was the date of the inauguration, and it is interesting to note that the 1900 schedule for the run approximated closely to that of 1883. The new Plymouth express (10.50 a.m. from Waterloo) was timed to take 105 min. between Salisbury and Exeter down, and the same time up, while in 1883, 107 min. were allowed down, and 103 min. up.

The overall timing between Waterloo and Exeter in 1900, which included a wait of 10 min. at Salisbury, was 3 hr. 35 min. down, and 5 min. longer up, as the up train called at Vauxhall for ticket collection. On June 1 of the following year, the Vauxhall stop was cut out and the wait at Salisbury reduced to 5 min., so, though the running speed remained the same, the journey between Waterloo and Exeter, both up and down, was done in 3½ hr., as in the trial trip schedule of 1883.

The first regular non-stop run between Waterloo and Salisbury was inaugurated in July, 1888, by the 11 a.m. from Waterloo—time allowed, 117 min. The non-stop run was at first made only on the down journey, and was confined to the summer service.

Yours faithfully,
REGINALD B. FELLOWS

Are Our Railways a Disgrace?

Eynesbury, St. Neots. April 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Although the letter from Mr. R. B. Stoker, published in your issue of March 14, was very interesting, it is not much good comparing British conditions with obscure little stations serving villages on the prairies and backwoods of Canada and the U.S.A., where traffics are so sparse that trains may serve them on only two or three days in the week.

A more proper comparison to make is with one of the railways operating in the Eastern States of America, where conditions, populations, and traffics are similar to those of one of the British railways. One of these American companies claims to run more passenger trains at a speed exceeding 60 m.p.h. than the grand total of any other country.

It is, however, not in the passenger train services that the disparity between American, British, and other European railways is so great, but in their goods and mineral train services. The Americans always have concentrated on attaining a very high standard of efficiency in these, in order to develop their industries by providing them with very low rates to offset their longer hauls. First, they built 20-ton wagons which, provided with much stronger couplings, enabled them to double the loads of trains and cut the costs of transport practically by one-half. Pursuing this policy of building larger, and still larger, wagons, 50-, 60-, and 70-tonners are now in general use, and average rates—which were once higher than in England—have fallen gradually from 2¾ cents to under 1 cent a ton-mile.

To these factors, the writer attributes the remarkable rise and high prosperity of the U.S.A. compared with Great Britain and other European countries.

It is overlooked invariably, however, that the longer American haul is due mainly to the traffics carried from the Eastern to the Western States, and *vice versa*—a distance of nearly 3,000 miles. If these traffics were excluded from the railways serving the highly-industrialised Eastern States—which compete with Great Britain, Germany, and other countries—their average haul probably would be not much longer than those of their European competitors.

Yours faithfully,
E. R. B. ROBERTS

Kings Langley, Herts. April 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have read this correspondence with interest. Whilst Mr. Dalton's statement which gave rise to it is so sweeping as to render argument both futile and unprofitable, it is nevertheless pertinent in the interests of truth to suggest that Mr. Stoker should have been more careful in his selection of examples on both sides. As things are, he has conveyed a false picture.

If he must light on such places as The Pas, Buctouche, and Fort Covington on the other side, then in common fairness he should have taken such places at Pwllheli, Kyle of Lochalsh, and Mallaig on this side. Has he, for instance, ever considered the total available train service at Welton, L.M.S.R.; or at Ranskill or Bradbury, L.N.E.R.; these places being on important main lines and not "back of beyond" as were his New World examples?

On the other hand, has Mr. Stoker never examined the New York-Philadelphia services? They are some six or seven times greater in number than the combined G.W.R. and L.M.S.R. express services between London and Birmingham ever have been, and far more conveniently spaced.

And what about the services of New York with Washington, Pittsburgh, St. Louis, Buffalo, and even Chicago? Or those between Chicago and St. Louis, Kansas City, and the Twin Cities? Even in Canada, the Toronto-Montreal service is not at all bad. Would he contend that the London-Edinburgh and Glasgow services are superior to those between New York and Chicago; or, for that matter, the London-Liverpool and Manchester services better than the New York-Washington ones?

And surely he underestimated seriously the number of luxury steam trains and crack diesel flyers now operating in the U.S.A. After all, the main point at issue is the provision of service at the points and between the areas where it is most needed, not the operations of any particular railway, either on its own main line or its remote branches. It is in this respect that Mr. Stoker appears to me to have given a false picture.

Yours faithfully,
FAIR'S FAIR

L.N.E.R. Locomotive Development

61, Rupert Street,
Glasgow, C.4. April 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to the article under the above heading in your issue of March 28, in which you give praise to the Great Eastern Railway for using 10-in. piston valves with 20-in. × 28-in. cylinders, I would like to point out that, at least so far as Scotland is concerned, large diameter piston valves were by no means as uncommon as your correspondent would lead one to believe, as the following examples will show.

Peter Drummonds' 0-6-0, 2-6-0, and two classes of 4-4-0 on the Glasgow & South Western, all with 19½-in. × 26-in. cylinders, had 10-in. dia. valves, as also had the ex-Highland "Rivers" (C.R. "938" class), the H.R. "Clan," "75" class 4-6-0 goods, and "73" class 4-4-0. On the North British, the Atlantics, Glens, and superheater Scotts (except the first two) had 10-in. valves, and the superheater 4-4-2T with cylinders only 19 in. × 26 in. had valves the same diameter. The Caledonian used 9-in. valves for its express engines, but with Trick passages.

Yours faithfully,
MONTAGUE SMITH

Castes and Creeds on Indian Railways

Hove, Sussex. April 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In his letter on March 23, published in our issue of April 4, "A Student" asks for information regarding the "inferior" staff, by which he means, presumably, menial staff. As the Railway Board's annual reports do not appear to differentiate between menial and other non-gazetted staff, no such information is available.

Nor are figures for annual gross earnings of various creeds and categories of staff to hand, and I would suggest that "A Student" should be advised to address the High Commissioner for India, at India House, Aldwych, W.C.2, on these subjects.

Faithfully yours,
F. S. BOND

SURPLUS U.S. ARMY LOCOMOTIVES FOR SALE.—The U.S. Foreign Liquidation Commissioner in Paris, announced recently that 833 U.S.-built standard-gauge locomotives, surplus to the occupation needs of the U.S. Army in Europe, are being offered for sale. Locomotives on offer include 601 coal-burning mixed-traffic types, 117 coal-burning shunters, 101 oil-fired goods engines, and 14 oil-fired shunters. All the coal-burners, the bulk of which are stored in German yards in the Frankfurt and Stuttgart areas of the American Zone of Occupation, are classified as in "used, fair condition," and are priced at $10,000 each. The 115 oil-burning locomotives, which at present are in service in France, will be sold at prices in accordance with their condition. All prices are less than 25 per cent. of the original cost to the United States.

The Scrap Heap

MORE CIVIL SERVANTS

According to a return published as a White Paper (Cmd. 7086, Stationery Office, 1d.), the number of civil servants employed in Government departments increased by 8,189 in the quarter ended January 1, 1947. At that date the grand total was 722,294. There were increases in 27 departments. The Post Office, where numbers rose by 8,522 in the previous quarter, by January 1 had added a further 4,135, making a total of 258,326. The Inland Revenue staff increased by 1,964 to 47,766.

* * *

"FOUR-ALE BARS"

First class railway sleeper travel for its officers instead of overnight hotel expenses was agreed to by the Clerical & Administrative Workers' Union conference at Bridlington. Only two of the 200 delegates voted against it.

When Mr. Frank Mead (Manchester) said third class travelling expenses were good enough for a working-class organisation, the President, Mr. Scouller, replied: "Third class sleepers are worse than the slums. The railway people themselves refer to them as 'four-ale bars,' which I think is a good description."—*From "The Manchester Guardian."*

HOLIDAY DREAM

I was told the story of an employee who asked for her summer holidays to be postponed until autumn because by then she believed railways would be nationalised and she would get a free trip to the seaside!—*Mr. K. P. Smith, in a letter in "The Sunday Express."*

* * *

"GOLDEN ARROW" BIRTHDAY

April 15 was the first post-war birthday of the "Golden Arrow." When restored to service by the Southern Railway a year ago, it was the first post-war land and sea service to operate on a fixed timetable between London and Paris. Over 180,000 passengers have travelled from London by the "Golden Arrow" rail and cross-Channel service during the past year, including 70,000 in the Pullman car train. The autograph album carried on the train includes the names of the King and Queen of Greece, Mrs. Churchill, Mr. Bevin, Maurice Chevalier, Noel Coward, Lord Rothermere, Lord Justice Goddard, Sir Ralph Richardson, and many other celebrities. Last Tuesday, to celebrate the birthday, every lady passenger by the "Golden Arrow" Pullman train from Victoria received a buttonhole, presented at the barrier by two Southern Railway women ticket collectors, Mrs. Beatrice Florence Humm and Mrs. Louise Tucker.

Warm Up Your Letters!

The good old rule that business letters should be brief, clear and to the point is still in force. But the good old formal phrases that used to sprinkle every letter are apt to look cold, stiff and distant to modern eyes.

So humanize your letters. Try to make even the simplest an ambassador of good will . . . a living part of this Railroad's public relations program.

Address by Name

It's worth a good deal of trouble to find out the correct name of the person to whom you're writing . . . and so be able to say "Dear Mr. Blank" and not begin with a chilly, "Dear Sir."

Start with "You"

You and *your* are apt to make better beginnings for a letter than *I* or *We*. "You asked in your letter of . . ." "You will be glad to hear . . ." "Your reservations . . ."

Do "We Regret"

Such a formal phrase as "we regret" is likely to convey very little regret to the reader. "We are all genuinely sorry . . ." or "I am truly sorry . . ." both say the same thing much more convincingly.

Don't be a "Has Been"

1. "Your letter *has been* brought to my attention for reply." *Vague, unsatisfying.* 2. "Your letter reached Mr. So and So last Monday, and he promptly turned it over to me as the person who could most readily answer your question." *Warm, exact, convincing.*

Let's be Sincere

Simply signing a letter "Sincerely yours" is often a big improvement over "Very truly yours." But it is a great deal more effective if we've taken pains to make the whole letter human, cordial, genuine . . . in keeping with that final phrase.

[*From "Company Manners" issued by the New York Central System*

100 YEARS AGO

From THE RAILWAY TIMES, *April* 17, 1847

PERFECT SECURITY AGAINST FIRE, VIOLENCE, and FRAUD.—MILNER'S PATENT FIRE-RESISTING PRINCIPLE.—Unproved, Non-conduction, generating evaporation (in fire) at successive temperatures—self-contained, self-acting, and durable, as applied in MILNER'S ONE-CHAMBERED PORTABLE BOXES (1¼ inches thick), recommended of not less than one cube foot inside, for ordinary-sized dwelling houses and office buildings.

MILNER'S DOUBLE-CHAMBERED BOXES and SAFES (2 to 2½ inches thick), for warehouses, or extensive office, house, or shop premises.

MILNER'S DOUBLE BANKERS' SAFE (6 inches thick), equal to twenty-four hours' fire, for large mansions, warehouses, and extra hazardous risks, as each equal to the fire likely to come upon them in the entire conflagration of the buildings they are respectively adapted for.

MILNER'S "HOLD-FAST" FIRE, VIOLENCE, and FRAUD-RESISTING SAFES, CLOSETS, and STRONG DOORS, the *strongest safeguards extant*: no bodies under quarter-inch thick, nor doors under half-inch thick (solid wrought iron), with the strongest and most secure fastenings, and locks which their most skilful workmen cannot pick nor open, and enclosing Milner's unequalled fire-resisting chambers.

JAPANNED CASH BOXES (not fire-resisting), with Milner's impregnable detector locks.

MILNER'S IMPREGNABLE LOCKS, for all uses, and combination door latches.

Pamphlets may be had at the Works, and of the Agents; giving sizes, prices, description, experimental tests, in red heat, from one to twenty-four hours, by scientific and practical parties—the Liverpool Polytechnic Society, the Royal Dublin Society, Professor Main, Dr. Sir R. Kane, Mr. Creed, Mr. Woods, Mr. Stevenson, Mr. C. W. Williams, Mr. Herapath, &c., &c., and cases of actual fires, in which Milner's Safes—out of the 20,000 now in use—have preserved their contents, everything else being destroyed in the buildings, *including the contents of strong iron safes and drawers, standing beside Milner's.*

CAUTION.—None genuine but such as bear Milner's Patent Plates, dated 1840.—Any means of producing moisture or evaporation within or round a safe, as securing from fire, infringes these patents, and will be prosecuted.—Without the powerful aid of steam, *neutralising* 1,000 *degrees of heat*, no presumed bad conductor of heat, *in a thoroughly dry state* (which it will soon become in a dry office), will preserve the contents of a safe unburnt in a strong fire.

Milner's Works, 50A, Lord-street, 47 to 55, Cable-street; Show-rooms, 15, North John-street, Liverpool; London Depot, 47A, Moorgate-street.

* * *

IMMEASURABLE LOCOMOTIVES?

With greater enthusiasm than factual accuracy, one of our contributors recently described a British main-line locomotive as "immense." He probably did not appreciate that the word he used meant immeasurable or boundless.

* * *

A VOYAGE TODAY

A cure for advocates of State ownership would be for them to pay £72 for a first class passage in a Ministry of Transport controlled ship to India.

The pleasures of a sea trip have been removed and one is governed by rules from morning until night.

At Port Said, Suez, and Aden we were not allowed ashore, but watched passengers from a French ship in Aden merrily going to and fro.—*Mr. F. W. Dilnot, in a letter in "The Sunday Express."*

* * *

SLEEPING BERTHS

Recently, I went to St. Pancras Station to reserve a sleeper on the train to Scotland, and was told that the railway company could dispose of only 10 places, the remainder (or 50 per cent.) being reserved for the Ministry of Transport.

Quite apart from the fact that it has been abused in the past, the system is unfair on those whose homes and interests are within the railway zone. A farmer travelling to consult his lawyer, a landlord travelling to consult his architect, parents travelling to fetch their children from school, have equal rights to enjoy the amenities of the trains with the travellers sponsored by the Ministry of Transport. Why cannot they be put on the same footing?—*Mr. Herbert A. Grant Watson, in a letter in "The Daily Telegraph."*

XUM

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Shunting Locomotives Built in Union

The first two of 14 shunting locomotives which are being built in the Salt River Workshops are nearing completion, and should be in use by the end of April. These "S" class engines develop a tractive effort of 38,000 lb. Except for the wheels, and certain machinery for which overseas patents are held, the engines are being built entirely from parts made in South Africa, the decision to manufacture them in the Union having been taken because overseas firms have more work than they can handle for several years to come. The first two engines probably will be used in Cape Town, and the remainder will be distributed to the big marshalling and shunting yards of the Union.

The New Johannesburg Station

At the present rate of progress, the change-over from the existing station at Johannesburg to the new temporary station, now being built on the Wanderers' ground, will be made towards the end of next year. When the work is completed finally, the new station will cover twice the acreage of the present one.

It is necessary to lower the lines from 12 to 14 ft., and build the new station over them without interfering with the normal running of trains. Excavations for this purpose are being made on the Wanderers' ground. The layout will be completed in every detail, including the signalling and interlocking system controlled from Johannesburg Central signal box, so that when the final link-up is made, the lines and platforms will be ready for immediate use.

The new suburban station will be built on the lower level, and its ten platforms will be reached by escalators. There will be six main-line platforms, with direct access from the road, and liberal parking space will be provided at adjacent points. One of the advantages of the new station will be that the main-line and suburban concourses and booking offices will be at street level. New road bridges will span the station area, giving access to the northern suburbs.

INDIA

Railways May Need Burma Wood

India may have to seek the help of Burma to meet the railways' requirements of 70,000 tons of forest products, which include 40,000 tons of teak. Teak from the Central Provinces is unsuitable, and stocks in Bombay and Madras, the two provinces which have supplied most teak for war purposes, have now dwindled considerably and cannot meet the present demand. On the other hand, Burma also needs teak for post-war reconstruction. Inquiries are being made at present to ascertain the quantity of teak which may be expected from Madras.

Chief Commissioner's Budget Speech

Colonel R. B. Emerson, Chief Commissioner for Railways, presented the Railway Budget for 1947-48 in the Council of State on February 17. The budget was introduced in the Central Assembly on the same date by Dr. John Matthai, Member for Transport, as reported in *The Railway Gazette* of March 14.

In the course of his speech, Colonel Emerson said that progress had been made with the development of a central research station for railways. A site for laboratories, test tracks, workshops, and staff quarters had been chosen near Delhi Shakurbasti, and the construction of works already sanctioned had reached an advanced stage. It was hoped to finalise proposals for further developments of the research organisation during the coming year.

Train Looted by Mob

A passenger train was looted on March 18 by a crowd of people who stopped it beyond the outer signal of Bogra Station, Bengal Assam Railway. Six persons were arrested later.

Baluchistan—Sind Communications

A national highway linking Karachi with Baluchistan is being surveyed by the Military Engineers Services in co-ordination with the N.W.R. authorities. The N.W.R. is conducting also a survey for a direct Karachi—Quetta line. Both projects will be of material benefit to Baluchistan, and particularly to Kalat and Lasbella, providing that hilly country with much-needed railway and road communications.

CHINA

Canton-Kowloon Railway

The Canton-Kowloon Railway in 1946 carried a total of 1,508,625 passengers, and an aggregate of 197,483 tons of goods, according to the *Far Eastern Economic Review*. At present, two express trains run each way daily between Kowloon and Canton, covering the distance in 4½ hr. In addition, there is a slow service which takes about 8 hr.

UNITED STATES

Mail Rates Increase Sought

The railways have asked the Interstate Commerce Commission to fix a new basis of payment for the carriage of mails, which shall be not less than 45 per cent. in excess of the existing rates. It is pointed out that the cost of handling mails has increased more than 45 per cent. since 1940, and is now more than 100 per cent. above the level when the present rates were established in 1928.

Restoration of "Mountaineer" Express

On June 28 the "Mountaineer" transcontinental express will be restored between Chicago and Vancouver, B.C., after a lapse of five years. The train will operate over the C. & N.W. between Chicago and St. Paul; thence over the Minneapolis, St. Paul & Sault Ste. Marie to North Portal, Sask.; and will finish its journey over the C.P.R. A daily service will be provided until August 28, and the schedules have been arranged so that the train will pass through the most spectacular sections of Rocky Mountain scenery during daytime. Lounge and dining car facilities will be provided throughout.

Power for Fluorescent Lighting

A number of new coaches now under construction for the Pennsylvania Railroad will be provided with fluorescent lighting. This equipment is supplied with alternating current, and the opportunity has been taken of designing an installation of sufficient capacity to run, not only the lighting circuits, but also all a.c. motors, except that for the air-conditioning compressor. The cars are being equipped with 110-volt batteries, which drive rotary converters capable of supplying three-phase a.c. at 230 volts. Some of the converters are rated at 5 kW., but others will have an output of 6·4 kW. so as to be able to operate a.c. electro-mechanical refrigerators in kitchen-dormitory cars and dining cars.

In most of the vehicles the d.c. supply will be used for lighting only in emergency. Among the a.c. services provided, apart from fluorescent lighting and air conditioning, are drinking-water coolers, radio and public-address systems, and electric razor points.

CANADA

Pacific Great Eastern Extension

Mr. John Hart, Premier of British Columbia, has stated that he intends to arrange a conference of representatives of the Dominion Government and the two national railways, with a view to the Ottawa Government and the railways joining with British Columbia in partnership for the purpose of extending the Pacific Great Eastern Railway into the Peace River district. Surveys showed that the Peace Pass route would cost $20,000,000 to Hudson Hope, and another $12,000,000 to the ultimate destination, Dawson Creek, B.C. By using the Pine Pass route, the cost would be cut $10,000,000. The Government is building a $6,000,000 highway to Peace River *via* Pine Pass.

Mr. Hart reported that ten rich coal deposits had been found near Hassler Creek, and an eleventh was under survey at Johnson Creek, both near the highway and also capable of being tapped for railway service. The plans for extending the railway were reported in *The Railway Gazette* of April 26, 1946.

Alaska Highway Telegraph Service

On April 1, under an arrangement between the Canadian and United States Governments, the Northwest Communication System became available for public and commercial use between Edmonton, Alta., and Fairbanks, Alaska. Last year the Canadian Government took over from the United States that portion of the system erected on Canadian soil. Responsibility for its operation and maintenance was assumed last June by the Department of Transport, which now has appointed the Canadian National Telegraphs to operate the system on a commercial basis. The new service will bring the extensive Northwest districts of Canada and Alaska more closely in touch with the trade and commerce of Canada.

FRANCE

A Captured Armoured Train

To assist in raising funds for its members who suffered injury and loss in the course of their work for the Resistance Movement during the war, the Comité Nationale de Solidarité des Cheminots recently placed on sale an illustrated booklet dealing with an armoured train which was captured from the Germans at Saint-Berain on September 8, 1944. The train stopped at Saint-Berain to take water, but the tanks at the station had been emptied by the civilian population. A captured Captain of the F.F.I., who was held by the German crew, succeeded in making con-

tact with the forces of General Lattre de Tassigny, and a patrol was sent, accompanied by two tanks, to seize the train. The Germans had three similar trains, which were used to convoy troop and supply trains. The captured train consisted of eight vehicles, including two wagons for transport of tanks, and two armoured vans with cannon and machine-guns.

Paris Transport Deficits

Provisional revised estimates of the deficit in the Paris transport system, including the Metro and buses, for 1947 amount to fr. 3,589 million. This total comprises fr. 850 million for the Paris city lines; fr. 28 million for the suburban lines; fr. 194 million for the Sceaux outer suburban lines; and fr. 2,517 million for the bus system. Last December the total deficit for 1947 was estimated at fr. 4,659 million. Hence, the estimated loss has decreased by fr. 1,070 million, which is due to the higher fares in force since January 1.

International Train Delays

M. Maurice Lemaire, General Manager of the S.N.C.F., has replied to criticism of international train delays published in the *New York Herald Tribune*, by a letter pointing out that the S.N.C.F. is not responsible for loss of time by such trains before entering France. On the contrary, the S.N.C.F. often helps to make up lost time.

He quotes the fact that for the period January 20 to February 25, the S.N.C.F. reduced the time lost by the "Orient Express" 28 times, and by the "Arlberg Express" 26 times after these trains had entered France. The recovery often is appreciable. Six times, in the case of the "Arlberg Express," it was 1 hr. to 1½ hr.; and on seven occasions there were similar gains with the "Orient Express." M. Lemaire remarked that the S.N.C.F. should not be held responsible for the bad condition of some foreign vehicles included in the formation of international trains.

SWITZERLAND

Trips by Centenary Train

Interest in the centenary of opening the Zurich—Baden Railway (the first railway wholly in Switzerland) will be stimulated throughout the country by a tour to be undertaken by a reproduction of the original train. Test trips were made with the train immediately after Easter, and on April 21 it will be placed on exhibition at Zurich. The tour will begin from Zurich on April 23. Excursions in the train have been arranged at a number of places, and will cover a maximum distance of 10 km. for a nominal fare. The staff attached to the train will wear the colourful uniforms of the 1847 period.

BELGIUM

Co-operation with Czechoslovak Railways

The Belgian National Railways recently agreed to the request of the Czechoslovak Minister of Transport for the loan to Czechoslovakia of a number of the special train-ferry goods wagons which have been in use for through goods traffic between Great Britain and Belgium. It is stated that the wagons are needed for the export of Czechoslovak furniture to Britain.

The close co-operation between the Belgian and Czechoslovak railways extends also to the reduction of transit goods rates for Czechoslovak exports. These facilities concern, in the main, Czechoslovak products intended for Great Britain. Among the goods which are to benefit from the lower rates are building materials, furniture, plate and sheet glass, glass goods, and malt.

ITALY

Reconstruction Progress

Satisfactory progress was made with the reconstruction of Italian railways during the first quarter of the current year. There were 9,626 route-miles in serviceable condition at the end of March, as against 8,073 route-miles at the end of 1946 (see *The Railway Gazette* of March 21). Thus, less than 10 per cent. of the route-mileage of the Italian railways is still unserviceable.

Doubts have been expressed as to the economic justification of reconstructing the heavily wrecked central section of the old trans-Appenine line between Bologna and Pistoia (61½ miles). The only section of the line now being worked is the 12-mile portion between Bologna and Sasso Marconi; the rest of the line is derelict.

The "Porrettana," as the Bologna—Pistoia line is called, lost much of its former importance as a section of the Rome—Florence—Milan main line when the new double-track route between Bologna and Prato was opened in 1935.

Publications Received

Planning, No. 264. The Locomotive Building Industry. London: P.E.P. (Political & Economic Planning), 16, Queen Anne's Gate, S.W.1. 24 pp. 8¼ in. × 5½ in. Price 2s. post free.—This broadsheet, which is the subject of an editorial note in this issue, discusses locomotive production in the present circumstances of overtaxed railway workshops, and private builders who naturally are anxious not to lose ground overseas by switching a significant portion of their output to the home railways. Some solutions suggested are the continuance of austerity designs, concentration on mixed traffic standard classes, and extensive subcontracting. The need of better marketing facilities, and of a survey of markets formerly served by Germany, is emphasised.

Constructional Archwork. By H. P. Smith. London: Crosby Lockwood & Son Ltd., 20, Tudor Street, E.C.4. 7½ in. × 5 in. 154 pp. Illustrated. Price 7s. 6d. net.—This pocket-size text book is primarily intended to simplify for students and practical men the study of constructional archwork, without recourse to higher mathematics in the elucidation of its theory. It, therefore, concentrates on graphic investigations of design, and in the main uses only the simplest possible calculations. There is, however, one chapter included for those intending to go more deeply into the subject, as, for instance, for passing examinations, wherein the calculus is involved, but it is quite unnecessary for the practical man to study this chapter in order to grasp the subject generally. All kinds of arches are dealt with—brick, masonry, concrete, and steel—and there are ample diagrams and other illustrations to demonstrate their theory and æsthetic appearance. Whole chapters are devoted to both hinged and elastic arches. A 14-page appendix gives much valuable information, mostly in tabular form, upon such details as crown thicknesses, reinforced brickwork design and construction, and metal arc welding. This comprehensive little work should prove most informative for students and others.

Locomotives by Beyer, Peacock & Co. Ltd. Published by Beyer, Peacock & Co. Ltd., Gorton Foundry, Manchester. 64 pp. 8½ in. × 11 in.—This is a most attractively-produced album containing a large number of illustrations of locomotives constructed by the firm, and is, moreover, a useful reference book as it contains lists of the leading dimensions of each design. The text is printed in English, French, and Spanish so that a wide circle of potential readers is catered for. The compilers have also made the necessary conversions from metric to English units where the British version of lists of dimensions is concerned, in cases where locomotives have been built to the metric system of measurement. After a few well-chosen illustrations which give the reader a brief tour round Gorton Foundry, the main part of the book covers tender and tank locomotives of normal type, built by the firm during the last thirty-five years, for gauges ranging from 1 metre to 5 ft. 6 in. There are also brief sections on rack locomotives and on industrial Beyer-Garratt types (a separate brochure is devoted exclusively to the general Beyer-Garratt engines). Portable tools for locomotive running sheds are also illustrated; and a final illustration, of an annealing furnace in the firm's steel foundry, about to receive its charge, gives a good idea of the variety of steel castings produced at Gorton Foundry. In paper, printing, and general arrangement this brochure reaches a high level.

Scammell Mechanical Horse and Bedford-Scammell Tractor-Trailer Combination.—The first of these two publications of Scammell Lorries Limited, Watford, describes and illustrates types of the firm's mechanical horse tractors and trailers, which combine the manœuvrability of the horse and cart with the power and speed of the internal-combustion engine. The Bedford-Scammell is a joint product of the firm and Vauxhall Motors; the latter produces the four-wheel motor unit with trailer, equipped with Scammell instantaneous coupling gear.

Railway Goods Handling Plant.—We have received from Joseph Booth & Brothers, Rodley, Leeds, proprietors of Clyde Crane & Booth Limited, a brochure giving a comprehensive picture of their resources for producing all types of cranes and other goods handling plant. Among the many illustrations shown of wharf cranes, electric telphers, hand jib cranes, transporters, steam breakdown cranes, traversers for railway workshops, etc., are photographs of installations actually carried out in this country and overseas, including a battery of coaling transporters at Alexandria for the Egyptian State Railways, electric level luffing cranes at Grimsby Docks, L.N.E.R., a light breakdown train for the Indian State Railways, and a 30-ton electric Goliath crane with 5-ton auxiliary hoist for the G.W.R. at Birkenhead.

New American Rail Sections

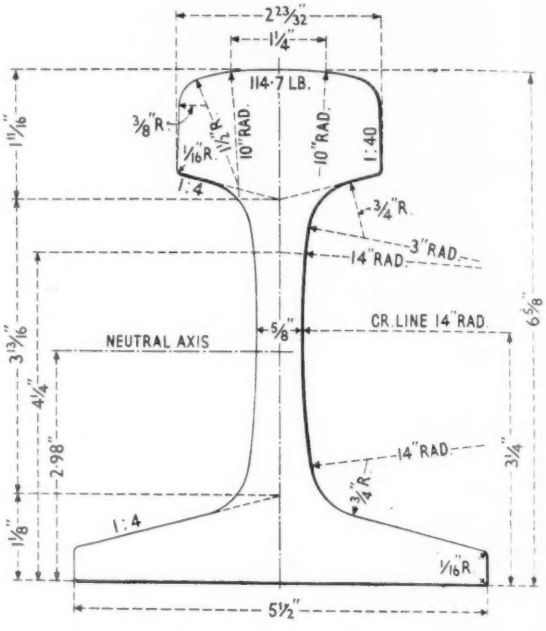
The familiar 112 lb. and 131 lb. rails have been replaced by newly-designed profiles of 115 lb. and 132 lb., and, for heavy traffic, 133 lb.

IMPORTANT decisions concerning standard U.S.A. rail sections were taken by the American Railway Engineering Association towards the end of last year, as a result of a study which began in 1940 and has been carried on by its Committee on Rail. Webb stresses have been studied in minute detail, and as a result, the Association has adopted three new rail sections, respectively of 115 lb., 132 lb., and 133 lb. and has abandoned its familiar 112-lb. and 131-lb. sections.

The new 115-lb. section supersedes the 112-lb. section of the Association, which has been withdrawn from its *Manual of Recommended Practice*. The former 131-lb. section also has been withdrawn from the *Manual*, and is superseded by the new 132-lb. and 133-lb. sections. In submitting the two new latter sections for adoption in place of the existing 131-lb. section, it was recognised that a departure was being made from an established policy of offering only a single section of given weight for one being superseded, but because a considerable number of heavy-traffic roads desired a rail having a deeper head than the proposed 132-lb section, it was decided that both the 132-lb. and the 133-lb. sections should be made available.

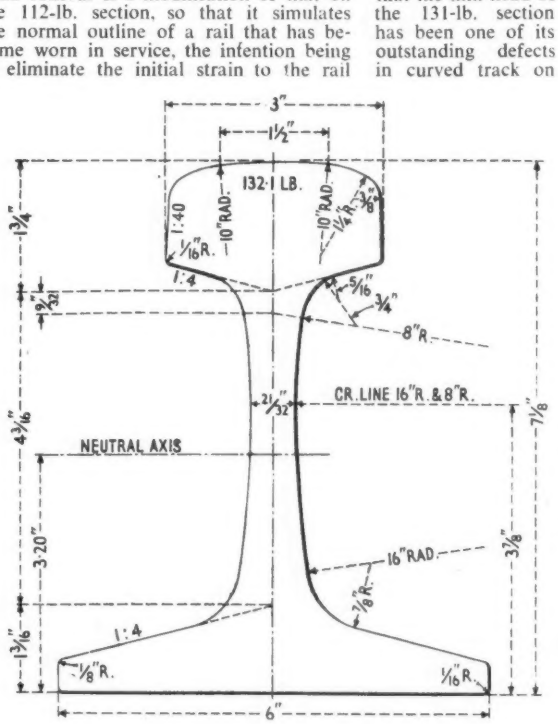
The new 115-lb. section (actually weighing 114·7 lb. a yd.) has the general proportions of the present 112-lb. rail, with the same overall height of $6\frac{5}{8}$ in. and base width of $5\frac{1}{2}$ in. There is a slight increase in radius of the lower web fillets. The head contour is a modification of that on the 112-lb. section, so that it simulates the normal outline of a rail that has become worn in service, the infention being to eliminate the initial strain to the rail until it becomes worn to fit the average wheel contour. The new 132-lb. rail (precisely 132·1 lb.) has an increase of 1·3 lb. in weight compared with the 131-lb. section. The new section has the same overall height of $7\frac{1}{8}$ in. and base width of 6 in. as the section it replaces.

The principal difference between the new 133-lb. and the new 132-lb. sections lies in the greater depth of head of the former. In overall dimensions, this 133-lb. section has the same base width as the 131-lb., but is $\frac{1}{16}$ in. lower, with an overall height of $7\frac{1}{16}$ in. The principal advantage of the 133-lb. rail is the greater amount of metal in the head, for use in areas where head wear is considerable. It has been found that the thin head of the 131-lb. section has been one of its outstanding defects in curved track on lines carrying heavy traffic. Rail of this section removed from main-line tracks after 12 to 16 years of service has been found in many instances to be unfit for relaying on branch lines.



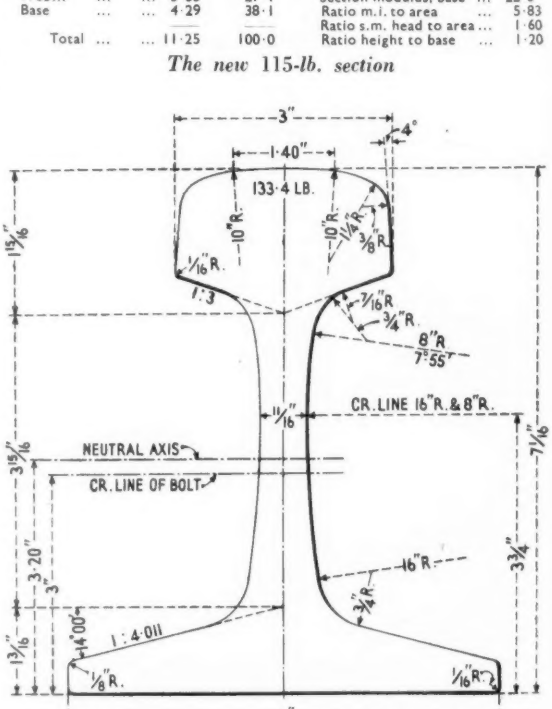
		Area Sq. in.	Per cent.		
Head	...	3·91	34·8	Moment of inertia ...	65·6
Web...	...	3·05	27·1	Section modulus, head ...	18·0
Base	...	4·29	38·1	Section modulus, base ...	22·0
				Ratio m.i. to area ...	5·83
				Ratio s.m. head to area ...	1·60
Total	...	11·25	100·0	Ratio height to base ...	1·20

The new 115-lb. section



		Area Sq. in.	Per cent.		
Head	...	4·42	34·1	Moment of inertia ...	88·2
Web...	...	3·66	28·3	Section modulus, head ...	22·5
Base	...	4·87	37·6	Section modulus, base ...	27·6
				Ratio m.i. to area ...	6·81
				Ratio s.m. head to area ...	1·74
Total	...	12·95	100·0	Ratio height to base ...	1·19

The new 132-lb. section



		Area Sq. in.	Per cent.		
Head	...	4·74	36·3	Moment of inertia ...	86·0
Web...	...	3·47	26·5	Section modulus, head ...	22·0
Base	...	4·87	37·2	Section modulus, base ...	27·0
				Ratio m.i. to area ...	6·57
				Ratio s.m. head to area ...	1·68
Total	...	13·08	100·0	Ratio height to base ...	1·18

The new 133-lb. section

Developments in Shrinking-on Wheel Tyres

A description of improved methods giving uniform heating with economic fuel consumption

By A. G. Arend

THE shrinking-on of wheel tyres has been under scrutiny for some years to ascertain what improvements may be made, as it is known that sometimes fuel is dissipated wastefully, and the most perfect conditions of shrinkage are not fulfilled always. Wartime developments have seen much expansion of induction heating, and, alternatively, light metals have been shrunk-on successfully by refrigeration methods, which, however, are not of the same interest to locomotive or rolling stock production.

Induction heating was thought to be likely to succeed in that, irrespective of the size of the wheel on which the tyre had to be shrunk, the same equipment would suffice. Heating times are very rapid, as the desired temperature is attained without delay, but the cost of current has been a retarding influence, although the action is both quick and clean and little or no skill is necessary for the operations.

One of the main claims in favour of induction heating is that practically no scale is formed. With light bars of steel, the scale ordinarily formed has been known to result in as much as 6 per cent. loss of the total weight of the heated piece. By induction heating, metal of 3 in. diameter can be raised to some 1,300° C. in 2 min.

In some instances, it is possible to utilise the lower frequencies produced by motor generator sets, rather than spark-gap or electronic oscillators, and metal larger than 2 in. can be heated economically for forging only with frequencies as low as 960 cycles per sec. During the war, damaged propellers of ships were heated conveniently by this system, thus obviating the removal which otherwise might have been necessary. So far as can be gathered, the costs of equipment and current alone can be cited against the use of induction heating for wheel tyres.

Defective and Uneconomical Methods

In earlier practice, coke fires were used, but gave no guarantee for the firm seating of the tyre on the wheel rim, although they succeeded in expanding the tyre by the required fraction of an inch. Small particles of coke were liable to become embedded between the inner face of the tyre and the peripheral surface of the wheel. The operating safety of the engine or other rolling stock thereby was endangered slightly by the possibility of the tyre loosening in service in extreme cases. This led to the use of the familiar gas-pipe ring, which was connected to a gas line and placed around the tyre, and on the internal face of which a large number of small flames was produced.

Although this arrangement succeeded in heating the tyre uniformly, a substantial waste of heat had to be suffered, as the gas was burned at extremely poor efficiency and for an unreasonably lengthy period. In the large repair shop, as many as 20 rings must be kept on hand, as a ring of the correct diameter is necessary for each of the numerous sizes of tyres. It was because of the labour required in changing from one size to another and the unfavourable fuel efficiency that improved methods were sought.

Devices for the rapid interchanging of the gas lines to save time have been the subject of a number of patents, but, on the whole, a more general system of arrangement which could suffice for all kinds of tyres without having to make changes was indicated.

One of the improved types of tyre heaters obviates these drawbacks besides making for great simplicity of design. It functions successfully with producer gas or illuminating gas, whichever is more readily available or cheaper. The arrangement suits all sizes of tyres, and the gas consumption is always in keeping with the actual size used, the smaller the diameter the lower the consumption of gas. To economise in space, the whole outfit can be installed below floor level, releasing additional space for traffic, and it is protected from dust there by being covered. The same equipment may be used for the heating of pipe-flanges, heating rings, and other units required in locomotive construction.

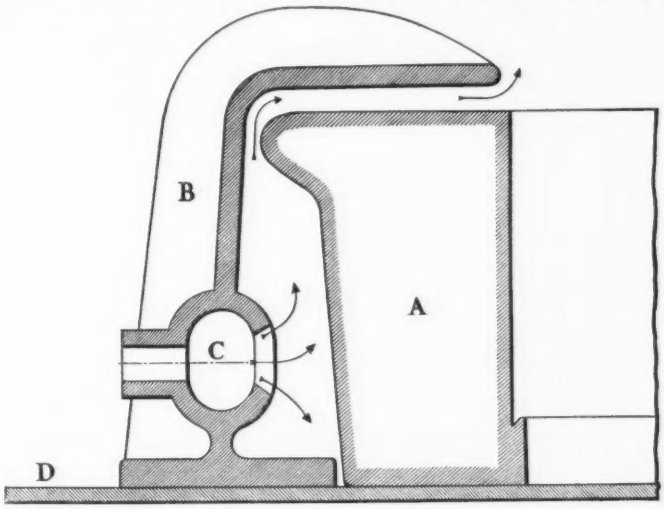
On the other hand, the appliance can be installed at any desired height above floor level, although the main accessories such as hose connections and tube ring may remain below. In the heater, an automatic device thoroughly mixes the air and gas, and introduces them by a blower into an annular pipe of comparatively large diameter so that the temperature can be maintained within very close limits. A number of segmental burners receive this gas mixture by the action of this blower, through the agency of flexible armoured hose sections.

The maximum efficiency of combustion is assured by the mixture of air and gas first entering a collector chamber for each burner where intimate mixing is completed. As regards the tyre itself, a current of hot air is caused to pass over the outer periphery and its top edge by numerous small jets of flame which issue from tiny holes leading from the chamber.

The burner segments are designed to cause the heated gases to be concentrated around and right over the top edge of the tyre, to ensure complete utilisation of the heat generated. Thus, only a small amount of heat is discharged unused into the atmosphere, and the tyre surface is exposed thoroughly to the action of the heat.

Adjustment to different sizes of tyres is accomplished simply by moving the different burner segments radially along the base plate. With the smallest diameters, some of the segments have to be disconnected and removed. Any types from the largest locomotive tyres of 9 ft. diameter downwards can be dealt with conveniently.

The accurate proportioning of the gas and air mixture to provide a flame which will impart a reliably known temperature to the exposed metal surface, is performed by an additional automatic device. As the calorific value of the gas, whether from water gas or illuminating gas source, may fluctuate, a small pilot line draws in at timed intervals a sample, with a known volume of air, and explodes it; the results are translated to a valve which controls the main circuit. In this way, the air input is increased or diminished according to the number of B.Th.Us. and ensures that the exact temperature is maintained.



A. Wheel tyre: B. Burner segment, several of which are fitted around the tyre: C. Collector chamber for each burner: D. Baseplate. The segments are moved radially along this plate to suit different diameters of wheels

Diagram showing main features of the heater

Previously, the gas and air mixture was controlled by a direct pyrometer link-up with the gas and air regulator, which, although quite satisfactory where the same size of tyre was handled, meant more time in re-assembling for other sizes of tyres, as the temperature degrees had to be taken from different segments to give an average result. With the improved method, the gas mixture itself gives the necessary temperature when burned, whether large or small tyres require shrinking-on. Because of this careful automatic regulation of the gas, the diameter may be enlarged by 0.08 in. in 12-15 min., according to the size of the tyre, at a consumption of some 32 cu. ft. of gas per foot of tyre diameter.

The possibility of backfire in the event of stoppage is forestalled by a protective valve attached to the mixer, a system which does not differ from existing practice. Whether the tyre heater is to be located above or below floor level depends on the prevailing conditions, and despite the economy in space given by the under-floor arrangement, the upraised type constructed at a desired height above floor level simplifies handling for the final assembly.

Jet Snow-Clearance Experiments on G.W.R.

Tests in South Wales successfully removed soft snow, but did not clear the deep drifts

IN conjunction with the National Gas Turbine Establishment, Ministry of Supply, experiments have been carried out by the main-line railway companies in the use of gas turbine aero engines for snow clearance. The engines are mounted on railway wagons in such a way as to bring the jets to play on the snow obstructing the track.

On the Great Western Railway, preliminary tests were carried out recently at Dowlais Top, on the single-line branch from Bargoed to Brecon. Snow had fallen intermittently for a period of six weeks, necessitating the closing of the line from February 8 to 12 on account of heavy drifts in cuttings, where the snow had become compacted into a solid mass, daytime thaws followed by night frost having turned it partly into ice.

The equipment used consisted of two Rolls Royce Derwent Mark I jet engines, mounted on welded-steel test frames bolted to the floor of a G.W.R. "Conflat" wagon. The engines were secured with their axes parallel to the track and 4 ft. 6 in. apart, symmetrically about the centre line of the wagon. Attached to the outlet of each engine, which was flush with the headstock of the wagon, was a discharge tube 8 ft. 3 in. long, supported by wire cables attached to the stanchions of the test frames. The engines were depressed to about 15 deg. below the horizontal, which brought the centre of the jet to strike the rail 13 ft. ahead, at the end of the tube, that is, 21 ft. 3 in. in front of the wagon headstock.

At the rear end of the "Conflat" wagon was mounted a 325-gal. aircraft fuel tank, with filters, to serve the engines. Between the engines and service tank, a control and instrument panel was erected, beneath which were the starting batteries (24-volt coach-lighting batteries). Behind the "Conflat" was a "Loriot B" carrying an R.A.F. 850-gal. bowser (a road motor fuel tank equipped with a mechanically operated pump). This served as a fuel storage tank in which the lubricating oil for the engine pumps could be mixed with the fuel oil.

The tests showed that soft snow was removed almost completely for the whole length of the sleepers with the engine at less than full throttle. Deeper hard snow offered more resistance to the blast, and where, owing to night frost, a hard layer of ice had formed round the rails, it was necessary to use the blast twice at the full throttle to clear the rails. At times the blast worked underneath the ice, and flung off lumps up to 4 ft. × 2 ft. × 6 in., sometimes removing portions of the slag ballast at the same time. On occasions snow was blown on the rollers of the switch rodding, which required careful cleaning, and signal wires were shaken violently, but not broken.

These initial tests indicate the possibility of clearing snow by the use of gas turbine engines, but much improvement in the mounting of the engines is required; and a means of enabling the jets to be traversed horizontally and vertically appears necessary to obtain reasonably satisfactory results. It has not, so far, been found possible on the G.W.R. to obtain successful results in clearing deep snowdrifts with jet engines.

In the illustrations on page 389 are seen the two engines, the service tank, and the control panel mounted on a wagon, with the fuel tank on the following wagon, being propelled up to a snow drift ready for work; a view of a cutting before the use of the jets; and the same cutting after the jets had been used. It will be noted that the rails have been well cleared, and that the snow on the outside of the curve, due to the "tangential" setting of the engine, has been cleared to a greater distance from the rail than the snow on the inside of the curve; also, that there is still a small amount of snow in a ridge down the centre line of the track.

The erection and working of the jet engines was in the hands of representatives of the R.A.F., the National Gas Turbine Establishment, and the Rolls Royce Servicing Department. Their co-operation with the local officers was of the greatest help, and the expert advice given to the company added largely to the success of the tests.

Arch Reinforcement of Truss Spans

Three bridges on the Paraná Railway of Brazil have been strengthened by placing two-hinge or polygonal steel arches under the truss spans

TO enable the parallel-chrd truss spans of three bridges on the Paraná Railway to carry considerably increased live loads, steel-arch reinforcement has been applied to them, doubling their strength. The spans measure 151 ft. (two), 197 ft., and 262 ft. in length, and the required future live loading would have subjected them to maximum stresses varying from 27,000 to 43,000 lb. per sq. in. Their reinforcement has reduced the maximum stresses to 15,000 lb. per sq. in., or under, and the steelwork involved weighs only from 32 to 60 per cent. of the estimated weight of new spans, with carrying capacities equal to those of the reinforced spans.

The two smallest spans are composed of continuous lattice trusses supported in the middle by a steel trestle. The reinforcement consists of two-hinge steel arches, one under each span, giving support at points one-third, or about 50 ft., from each end of the span. New vertical members above the points of support assist in transmitting the reaction to the top chord; some of the original diagonals had to be stiffened to resist changes in sign of the stresses.

The new steelwork was erected with the aid of hand hoists attached to the bottom chords of the old spans, for lifting the members from the bottom of the creek. The half-arches were tied back to the trestle and abutments with cables during erection, and when completed, they were allowed to rotate about their lower hinge pins by paying out the cables until they met correctly at mid-span and were riveted up. In these spans, maximum stresses were reduced from 40,000 to 14,220 lb. per sq. in., and the reinforcement steelwork weighs only 40 per cent. that of an equally strong new span.

In a second bridge, a truss span 197 ft. in length was reinforced by placing a flexible polygonal arch beneath it. Seven pairs of lattice vertical struts, erected on the chord points of the arch, support the seven central panel points of the original truss. Here, also, some of the diagonals of the old trusses had to be strengthened for reasons explained in the case of the first bridge. The weight of the reinforcement is only 32 per cent. of that of a new structure of equal strength. Erection was effected with scaffolding suspended by steel cables from the old trusses.

The São João Bridge

The largest span reinforcement is the 262-ft. main span of the São João Bridge, comprising Linville trusses; it carries the line over a gorge 230 ft. deep. The reinforcement consists of a two-hinge arch, providing support at four points under the old span. A travelling hoist running on the top chords of the original trusses was used to lift the new steelwork from the bottom of the gorge, but it had to be designed specially to straddle trains passing over the bridge during strengthening. To enable this traveller to be used simultaneously with passing trains, the speed of traffic was limited to 5 m.p.h. to obviate impact.

After the arch shoes had been fixed on previously prepared footings, and the legs had been assembled, their tie-back cables were replaced by a block-and-tackle anchorage system on each side of the gorge. The free end of this tackle was attached to a counterweight resting on four jacks. The erection of the central portion of the arch then proceeded, each counterweight being heavy enough to hold the respective half of the arch in equilibrium and still exert a downward pressure on the jacks. When the two halves met, precise adjustment was effected by raising and lowering the jacks.

In this bridge, maximum stresses were reduced from 33,000 to 14,220 lb. per sq. in. by means of the reinforcement, which weighs some 60 per cent. of the estimated weight of a new superstructure of the same carrying capacity. Design, fabrication, and erection were, with one exception, entrusted to Sr. Oscar Machado da Costa—Chief Engineer to a firm of Brazilian engineers and contractors—to whom we are indebted for the above details, recently published by our American contemporary *Engineering News-Record*. The São João Bridge fabrication was carried out by the American Bridge Company.

NOTTING HILL GATE, L.P.T.B., RECONSTRUCTION.—A new station is to be constructed by London Transport at Notting Hill Gate to supersede the present separate stations of the Metropolitan and Central Lines. The two above-ground entrances will disappear, and access will be by means of five short stairways leading to a large sub-surface ticket hall, 56 ft. long and 46 ft. wide. Lifts will be replaced by escalators. There will be access to both the Metropolitan and Central Line platforms from the ticket hall. Direct interchange between the Metropolitan Line and the Central Line will take place by means of a subway and escalators. It is hoped, if manpower and other circumstances permit, that work will begin on the new station during the summer.

Jet Snow-Clearance Experiment on G.W.R.

(*See article opposite*)

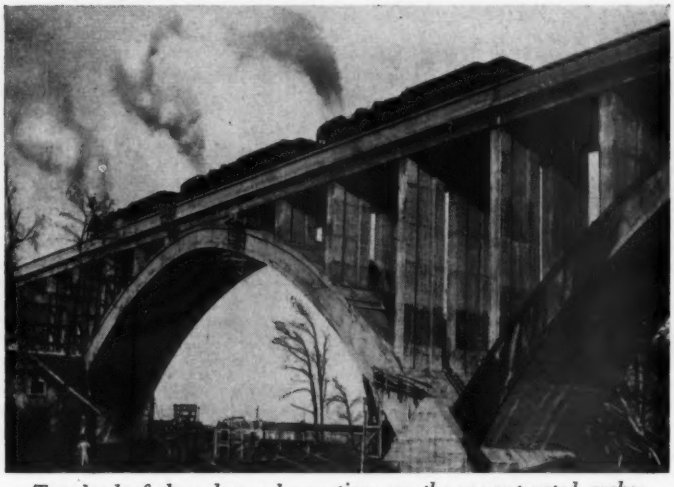
Propelling the jet engines to the drift for clearance operations

Snow in the cutting at Dowlais Top before clearance

The same cutting after use of jets, showing rails cleared of snow

Nogent-sur-Marne Viaduct, French National Railways

The four main spans, demolished by the Germans, have been replaced by three reinforced concrete arch spans



Test load of three heavy locomotives on the reconstructed arches

THE Eastern Division main line of the French National Railways from Paris to Mulhouse and Basle, crosses the valley of the Marne between Nogent-Le-Perreux and Villiers-sur-Marne stations. Nogent viaduct, carrying the line over the valley, is one of the largest on the system, being over 2,700 ft. in length and more than 90 ft. high over the river. It was built in 1855-56 as a double-line structure with 34 masonry arches, 25 15-m. (49-ft. 3-in.) spans in the Paris or Nogent approach, 4 50-m. (164-ft.) main spans, and 5 more 15-m. spans in the Villiers approach; the main spans are over the two branches of the Marne and the Ile des Loups between them. It was a simply-designed and well-built viaduct.

German Demolitions

In their retreat before the advancing Allies, the Germans completely demolished the four main spans in August, 1944, leaving a 700-ft. breach and obstructing the navigable channel of the river, as well as littering the island with some 700,000 cu. ft. of débris. As this line is an international artery, and its destruction both interrupted communication with the East and also cut off all the country east of the Marne from Paris, this—owing to the extent of the breach—was one of the most serious demolitions on the French railways.

Temporary reconstruction was not considered feasible for this same reason, and it was, therefore, decided that permanent restoration must be undertaken as soon as possible. Owing to the impossibility of obtaining stone in adequate quantity, it was decided to rebuild the main spans in reinforced concrete. As one of the piers of the original structure was in the navigable channel, opportunity was taken in rebuilding to avoid repeating this obstruction by reducing the number of main spans from four to three, with both the intermediate piers on the island.

The new concrete arches are parabolic, and measure respectively 262 ft. (spanning the Nogent, or navigable channel), 230 ft. and 223 ft. The piers are in solid mass concrete, 59 ft. 6 in. × 31 ft. 6 in. at the base, and 59 ft. 6 in. high; about 20 ft. of this height being above ground level. They are founded on limestone, and excavation and foundation work were carried out in the open, with steel sheet-piling cofferdams and pumps to exclude seepage. Each span consists of twin arches and decks side by side, bonded together at intervals, one under each track. Both arching and decking are of cellular design. The decking is carried by vertical columns of double-T section, based on the arch ribs; the columns are spaced from 23 ft. to 33 ft. apart. The arch rings measure 6 ft. 10 in. in depth at the centre and 11 ft. 6 in. at the springing. The general design can be seen from the accompanying illustrations.

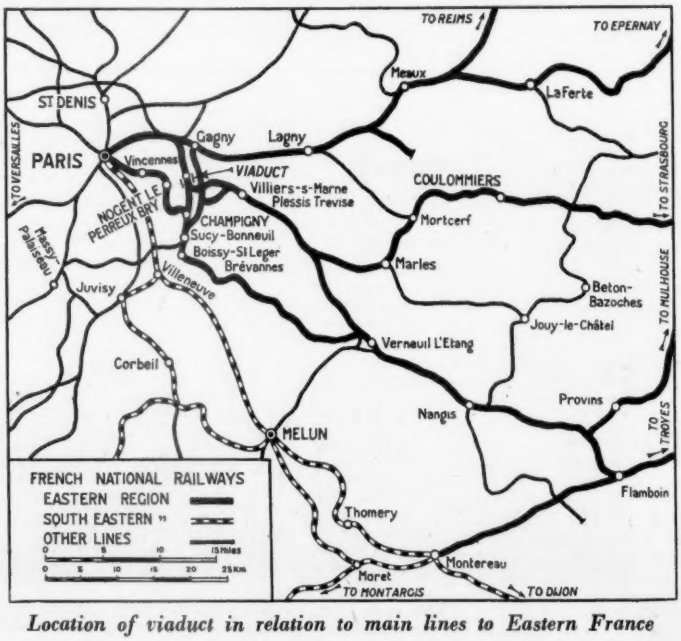
The work of reconstruction began in August, 1945—just a year after demolition, spent mostly in clearing away the débris—and was carried out with the aid of two cableways to facilitate erection, each capable of carrying 2-ton loads, or 4 tons working together. For the two smaller arches, tubular scaffolding was used as centring, but for the largest one special arrangements had to be made so as not to obstruct navigation. These consisted of timber centring fabricated on the island in three sections. Two side sections were erected vertically against the Nogent abutment and pier respectively, to which they were secured by tackle, each section being capable of rotation about a base hinge towards the other as the tackle was paid out.

Meanwhile, the middle section was floated out and raised by the cableways to form the key section of a timber arch, when the side sections moved inward and were secured at each side of it.

Quantities of Material

In all, some 20,000 cu. m. of materials of different kinds were used in this work. They included about 10,000 cu. m. of concrete—involving 3,700 *tonnes* of cement and 700 *tonnes* of steelwork reinforcement; 250 *tonnes* of tubular steelwork and 2,000 cu. m. of timber in the centring. The first track was opened for traffic on December 14, 1946 (see our January 10 issue). The clearing away of the débris and the reconstruction work were entrusted to Enterprises Caroni and Limousin respectively, the work being supervised by the engineering staff of the French National Railways.

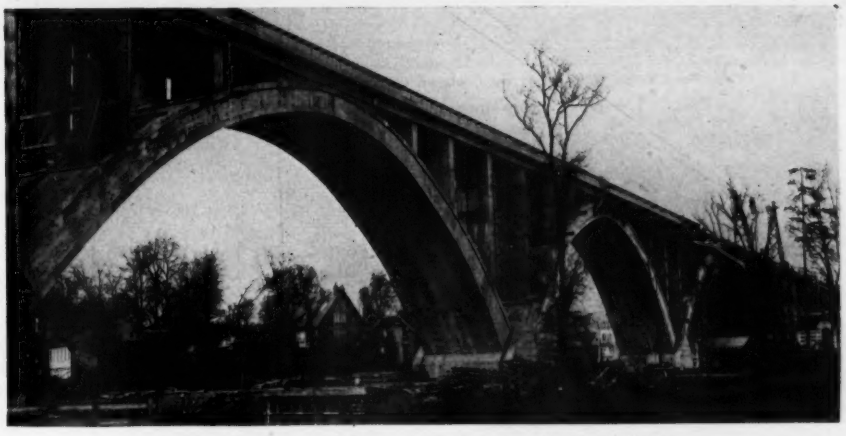
While the viaduct was under reconstruction, long-distance trains of the Eastern Region ran temporarily to and from the Gare de Lyon, using the Eastern Region branch between Flamboin and Montereau, and the South-Eastern Region (former P.L.M.) thenceforward. Local services were diverted to the Bastille Station in Paris *via* Champigny and Vincennes. The spur line just west of Villers-sur-Marne, shown on the map below, is of new construction. It was undertaken to permit through running of goods trains from the Strasbourg and Mulhouse directions to the marshalling yards at Vaires, between Gagny and Lagny. Previously, reversal was necessary on the outskirts of Paris, and there was considerable congestion on the main line west of Gagny.



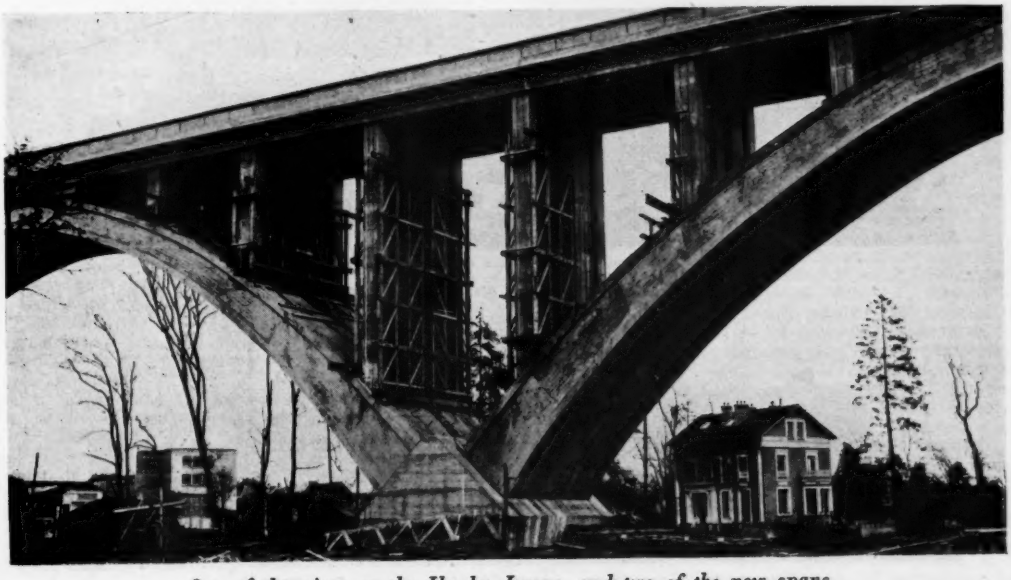
Location of viaduct in relation to main lines to Eastern France

Nogent-sur-Marne Viaduct, French National Railways

Two of the main spans after destruction by the Germans



The three new main arch spans nearing completion



One of the piers on the Ile des Loups, and two of the new spans

New Standard L.M.S.R. Locomotives

Eleven locomotive types have been developed which can cover all traffic requirements

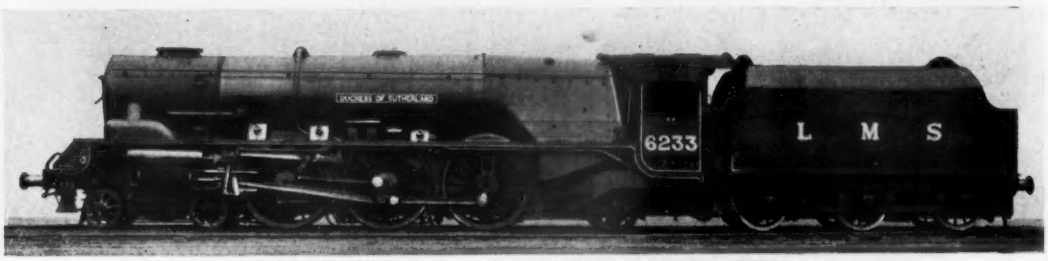
THE trend in locomotive development has been towards types able to deal with a wide range of traffic. At one time, it was thought necessary to produce numerous designs to cover variations of service and route, but interchange of locomotives after the grouping exploded the theory of special locomotives for special routes, and modern development in design has greatly extended the scope of each individual type.

The advantages of this development are the increased availability of the modern locomotive, enabling it to take its turn on varying classes of traffic, and the economy obtained by standardisation and quantity production of renewable parts.

Since the grouping, the L.M.S.R. has built new locomotives to a strictly limited number of basic types, but stagnation in design has been avoided by introducing successive modernised versions of these basic types. The position at the present time is that eleven locomotive types can cover the whole of the traffic requirements on the L.M.S.R. system.

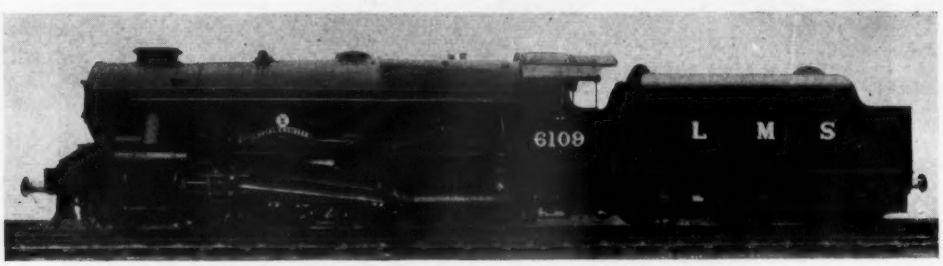
The illustrations below and on the following page show the latest form of each locomotive class, reproduced approximately to the same scale. All new locomotion construction is to one or other of these designs.

Three of the standard types are new designs, namely, the Class "4" 2-6-0 freight engine and the Class "2" 2-6-0 tender and 2-6-2 tank engines. The Class "4" 2-6-0 freight engine is being designed, but has not yet been built. The first of the Class "2" 2-6-0 tender and 2-6-2 tank engines have been completed recently at Crewe works, and were described in *The Railway Gazette* of January 3, 1947.



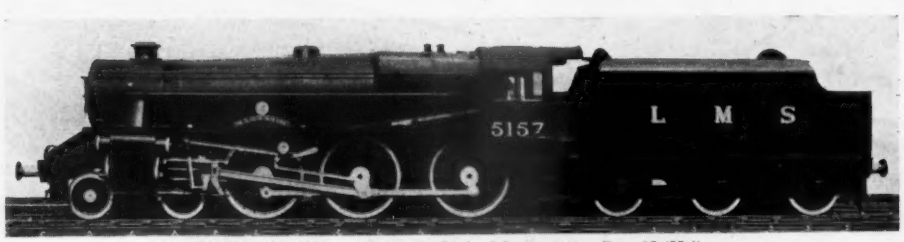
Total weight, 161 tons 12 cwt.; wheels, 6 ft. 9 in.; tractive effort, 40,000 lb.

Class "7" 4-6-2 (non-streamline) 4-cyl. passenger locomotive



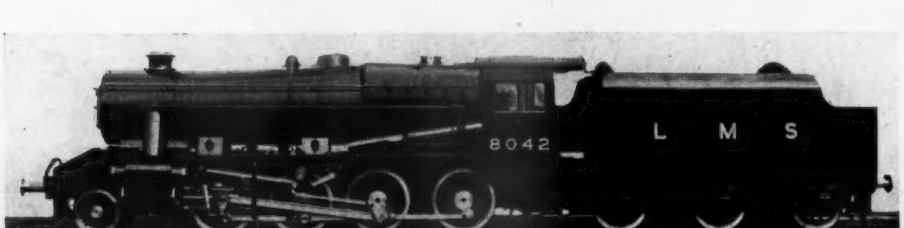
Total weight, 137 tons 13 cwt.; wheels, 6 ft. 9 in.; tractive effort, 33,150 lb.

Class "6" 4-6-0 "Royal Scot" 3-cyl. passenger locomotive



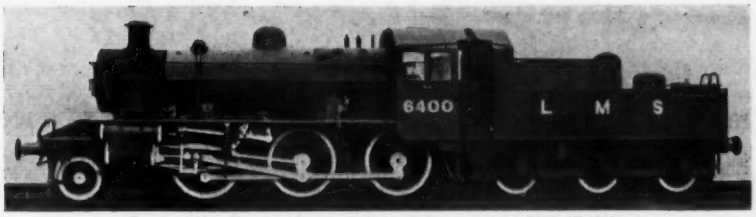
Total weight, 125 tons 15 cwt.; wheels, 6 ft.; tractive effort, 25,455 lb.

Class "5" 4-6-0 2-cyl. mixed-traffic locomotive



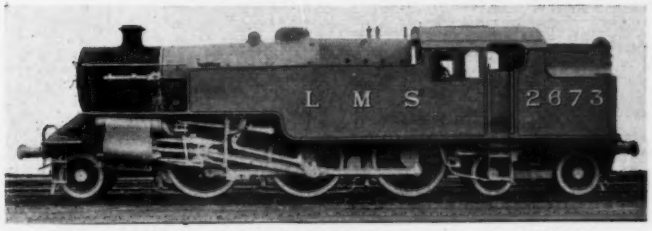
Total weight, 125 tons 15 cwt.; wheels, 4 ft. 8½ in.; tractive effort, 32,438 lb.

Class "8" 2-8-0 2-cyl. freight locomotive



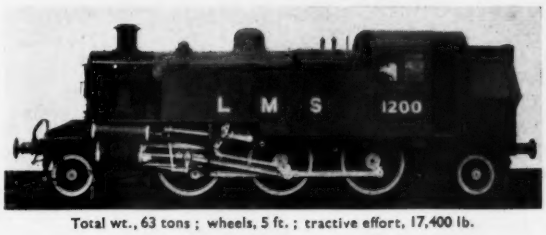
Total weight, 82 tons 10 cwt.; wheels, 5 ft.; tractive effort, 17,400 lb.

Class "2" 2-6-0 2-cyl. freight locomotive



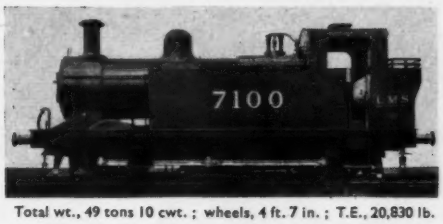
Total weight, 85 tons 5 cwt.; wheels, 5 ft. 9 in.; tractive effort, 24,670 lb.

Class "4" 2-6-4 2-cyl. mixed-traffic locomotive



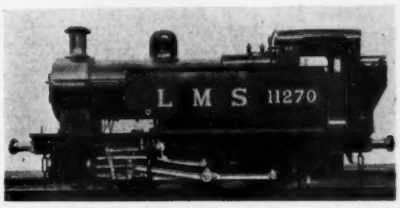
Total wt., 63 tons; wheels, 5 ft.; tractive effort, 17,400 lb.

Class "2" 2-6-2 2-cyl. mixed-traffic locomotive



Total wt., 49 tons 10 cwt.; wheels, 4 ft. 7 in.; T.E., 20,830 lb.

Class "3" 0-6-0 2-cyl. freight locomotive



Total wt., 43 tons 12 cwt.; wheels, 3 ft. 11 in.; T.E., 18,400 lb.

Class "2" 0-6-0 2-cyl. freight locomotive

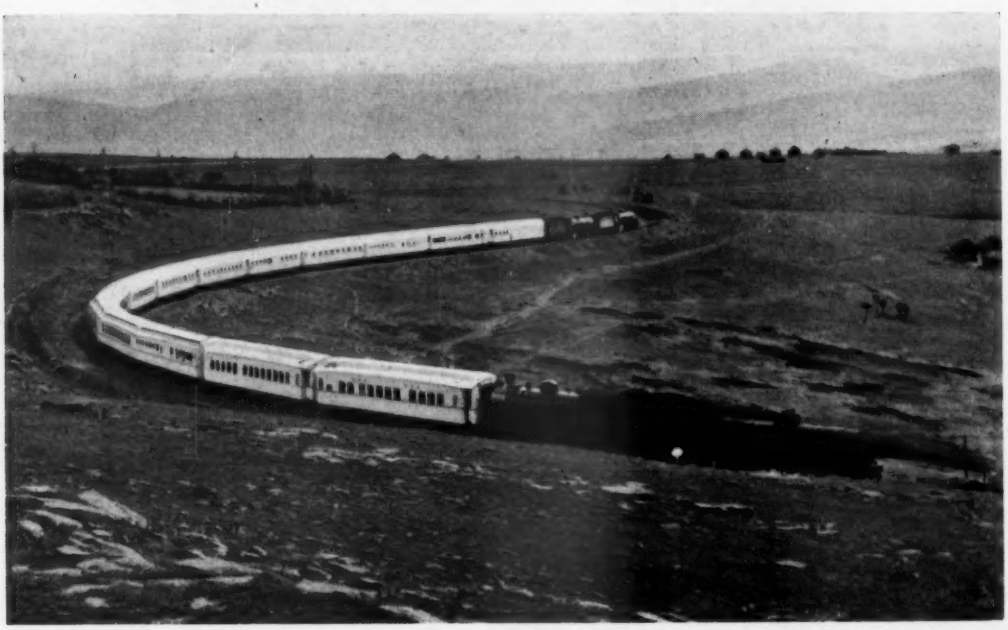
Total wt., 47 tons 5 cwt.; wheels, 4 ft. 0½ in.; T.E., 35,000 lb.

0-6-0 diesel shunting locomotive

INSTITUTE OF TRANSPORT METROPOLITAN GRADUATE & STUDENT SOCIETY.—The annual report for 1945-46 of the Institute of Transport Metropolitan Graduate & Student Society states that the total number of members recorded in the register at September 30, 1946, was 451. During the year, 100 members joined, and 36 severed their connections with, the Society. In consequence of the recent setting-up of a Metropolitan Section of the Institute of Transport, the Graduate & Student Society will consist of graduates and students only; members of the Society who become corporate members of the Institute after that date will resign their membership and become attached to the Metropolitan Section; this will apply also to all corporate members who are now members. It is recorded that Mr. S. A. Carter retired from the committee of the Society in February, 1946, after a number of years of useful service, and that his place was filled by the appointment of Mr. A. F. Wallis. Mr. L. H. K. Neil has concluded his term of office as the Institute of Transport Council's representative on the Society's committee, and the report records the Society's thanks to him for his continued interest in its affairs; Mr. C. T. Brunner has been appointed in his place. Appreciation is expressed also of the assistance willingly accorded by Mr. F. W. Crews, Secretary of the Institute, and his staff. During the course of the 25th anniversary dinner held on October 31 last, a presentation was made to Mr. C. F. King as a mark of the esteem in which he is held and sincere appreciation of his valuable and unstinted service as Honorary Secretary of the Society during 21 years; the Committee at its meeting on November 20 last desired that this should be placed on record in the annual report.

EARLY CONTRACTOR'S LOCOMOTIVE FOR NEWCASTLE MUSEUM.—A locomotive which has been in continuous service for nearly 70 years is to be exhibited in the Newcastle Science & Engineering Museum. It is a 0-4-0 Black, Hawthorne locomotive, the only surviving example of the earliest type of industrial locomotive designed by that company. It was built in 1874, and used at a works in Hebburn until 1943. When the works was closed in that year, the locomotive was sold to George Cohen, Sons & Co. Ltd., of London and Leeds, for dismantling and disposal. This firm presented the engine to the North Eastern Historical Engineering & Industrial Society, which was anxious that it should be saved from the scrap heap. It was still capable of pulling a substantial load. The maker, Black, Hawthorne & Company, was a Gateshead engineering firm, established in 1866.

The South African Royal Train in the Cape Province



Three S.A.R. & H. "190" class locomotives working the Royal Train in the Transkei district of the Cape Province

New Type Oil-Storage Plant at Swindon, G.W.R.

Refuelling an oil-burning locomotive at Swindon from the new type of overhead equipment which is being installed at 14 places on the G.W.R. (See news paragraph in our April 11 issue)

RAILWAY NEWS SECTION

PERSONAL

Lord Dudley Gordon has been elected President of the Institution of Mechanical Engineers for 1947-48. He is Chairman of Hadfields Limited and of J. & E. Hall Limited, and is a Past-President of the Federation of British Industries.

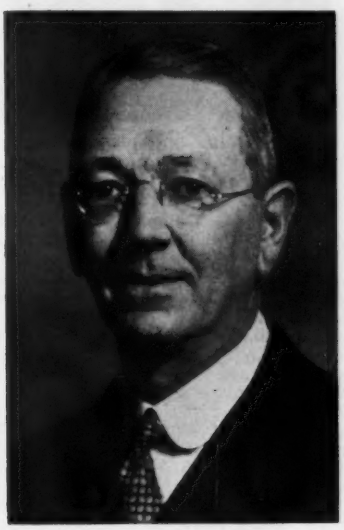
Mr. Edward Huskisson, Director & General Manager of Thos. Cook & Son Ltd., who on May 15 next will relinquish the General Managership but retain his seat on the board, and who in that month also will leave for a tour of America, was educated at Merchant Taylors' School, and joined Thos. Cook & Son in 1898. He served for the first five years in the Banking Department, but in 1903 was transferred to the Travel Department, and, after working for some time at the head office, was attached in turn to a number of London branches and to offices in France, Switzerland, Germany, Italy, and Austria, serving first as cashier, later as booking clerk and finally as Branch Manager. After this varied experience he was appointed Assistant to the late Mr. H. H. Spiller, then the company's "ambassador at large," and in course of time succeeded Mr. Spiller, when he became responsible for a great deal of the reconstruction work necessary after the 1914-18 war. In 1935 Mr. Huskisson was appointed General Manager of Thos. Cook & Son, and he was elected to the board at the end of 1938. During his service with the company, Mr. Huskisson has travelled in every country in Europe, including Russia before and after the 1914-18 war, and has visited the Balkan States, Asia Minor and America. He has been decorated by the Norwegian and Belgian Governments for his services to international tourism.

Mr. Edward Huskisson

Director & General Manager, Thos. Cook & Son Ltd., who relinquishes the latter post, remaining a Director

Mr. James Maxwell

Appointed General Manager, Thos. Cook & Son Ltd.



Captain B. H. Peter

Who retires next September from the Westinghouse Brake & Signal Co. Ltd., and now relinquishes the Managing Directorship, becoming Deputy-Chairman

Mr. Carl Niderost, K.C., has been appointed Assistant Secretary of the Canadian Pacific Railway Company. He has been an Assistant Manager of the Personnel Department since 1943, the year in which he joined the C.P.R. Mr. Niderost will be Secretary of Canadian Pacific Steamships Limited, and Canadian Pacific Air Lines Limited.

Mr. Rupert E. Beckett, Chairman of the Westminster Bank Limited, has been elected Chairman of the Committee of London Clearing Bankers for the ensuing year, and the Marquess of Linlithgow, Chairman of the Midland Bank Limited, has been elected Deputy-Chairman of the committee. Mr. Beckett is a Director of the London & North Eastern Railway Company.

Mr. James Maxwell, Assistant General Manager & Secretary, Thos. Cook & Son Ltd., who, as recorded in our April 4 issue, has been appointed General Manager from May 15 next, was born in Glasgow 42 years ago, and was educated at Allen Glens and the West of Scotland Commercial College. He joined Thos. Cook & Son at the age of 20, and after a period of training in the Glasgow and London offices, served in Paris, Rome, and Nice, and then spent six years in the Middle East, working in Cairo, Port Said, Alexandria, Luxor (where he was appointed Manager at the age of 24), Jerusalem and Baghdad. Later he visited Iceland and Scandinavia. At the age of 28 he was sent to Bombay as Assistant General Manager of all the company's offices in the East, and four years later went on a tour of inspection throughout China, Japan, the U.S.A. and Canada. He was appointed Secretary of the company in 1940, and Assistant General Manager in 1943. Mr. Maxwell will serve on the Home Holidays Committee of the British Tourist & Holiday Board. He is a Director of British Holiday Estates Limited, Thos. Cook & Son (Australasia) Pty. Ltd., Thos. Cook & Son Inc., Thos. Cook & Son (South Africa) Ltd., and Wagons-Lits-Cook Organisation Mondiale de Voyages S.A. Belge.

Mr. J. S. Hutchison, a Director of the British Oxygen Co. Ltd., has been appointed Vice-Chairman.

Mr. J. G. Fawcett has been appointed Assistant General Manager, and Mr. C. A. Allpress, Assistant to the General Manager, of the Nyasaland Railways.

We regret to record the death on April 8, at the age of 64, of the Hon. Daniel G. Sullivan, Minister of Industries & Commerce, and until 1941 also Minister of Railways, in New Zealand.

Captain B. H. Peter, C.B.E., who, as recorded in our April 4 issue, is retiring from the Westinghouse Brake & Signal Co. Ltd. on September 30 next, and who, as from March 25 last, has relinquished his appointment as Managing Director, and has become Deputy-Chairman, was educated at Blundell's School, Tiverton, and the City & Guilds College, and in 1903 joined the London Electric Railways. In 1907 he was appointed Signal Engineer, District Railway, and, in the next year, Signal Engineer, London Electric Railways. In 1911 he joined the McKenzie, Holland & Westinghouse Power Signal Co. Ltd. During the war of 1914-18 Captain Peter served with the Royal Engineers; and in 1920 he was made Chief Engineer of the amalgamated companies forming the Westinghouse Brake & Saxby Signal Co. Ltd., of which he subsequently became General Manager. He was appointed Managing Director in 1930. During the recent war he also acted as South Western Regional Officer, Board of Trade, and he has served as a member of the Industrial Council, Board of Trade; of the Economic Advisory Committee, Colonial Office; and of the 1944 Patent Committee.

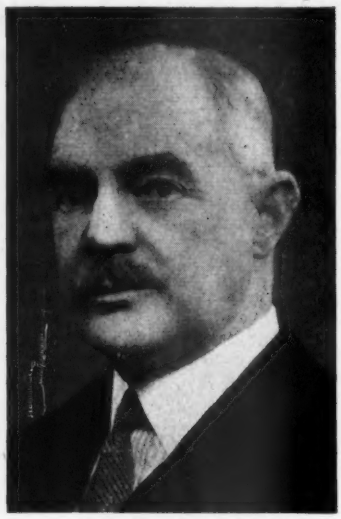
Mr. H. Gibson has been elected a Director of the Manchester Ship Canal Company, to fill the vacancy caused by the resignation of Sir Arthur Pickup.

Mr. J. H. Jones, General Agent, London City Office, Canadian Pacific Railway, has retired, and is succeeded by Mr. C. B. Gerrard, Assistant General Agent in that office.

XUM

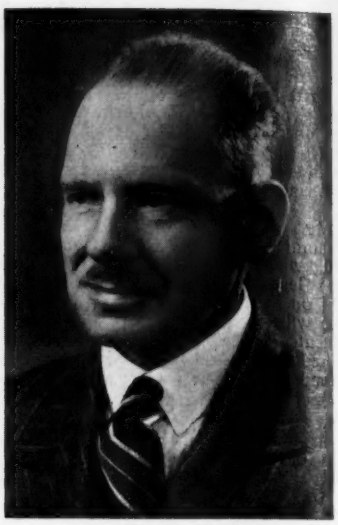
Mr. J. N. Compton

Appointed Chief Controller of Standardisation, Railway Board, Government of India



The late Mr. G. H. Griffith

General Manager, Pullman Car Co. Ltd., 1928-45



Mr. T. W. Polding

Appointed District Passenger Manager, Leeds, L.M.S.R.

Mr. J. N. Compton, M.I.Mech.E., M.I.Loco.E., who has been appointed Chief Controller of Standardisation, Railway Board, Government of India, in succession to Mr. E. Ingoldby, C.I.E., granted two years' leave preparatory to retirement as from January 7, was educated at Marlborough College. Mr. Compton was a pupil to Dr. H. S. Hele-Shaw, and served an apprenticeship with Beyer, Peacock & Co. Ltd., after which he was appointed Assistant Mechanical Draughtsman, Great Indian Peninsula Railway, in 1922. From 1928 to 1931 he was Secretary to the Locomotive and Carriage & Wagon Standards Committees in the Central Standards Office, Railway Board. He returned to the G.I.P.R. and in 1936 was promoted Deputy Chief Mechanical Engineer, after having been Works Manager, Locomotive and Carriage & Wagon Workshops. His services were lent to the Director-General of Munitions Production in 1941, when he was Director of Civil Armaments Production (Ammunition), and Additional Deputy Director-General, R.A.F. Division, during which period he organised the first civil maintenance units for the R.A.F. Mr. Compton was seconded as Assistant General Manager of Tata Aircraft Limited in June, 1943, and returned in May, 1944, to the G.I.P.R., of which he became Chief Mechanical Engineer in March, 1945.

The Minister of Transport has appointed Mr. B. P. H. Dickinson to be his Private Secretary, in place of Mr. F. C. Hampden, appointed an Assistant Secretary.

Mr. F. E. Hough, O.B.E., M.I.Loco.E., lately Locomotive & Carriage Superintendent, Nizam's State Railway, has joined Rhodesia Railways as Chief Mechanical Engineer in place of Major M. P. Sells, O.B.E., who retired last year.

We regret to record the death on April 11 of Mr. George Herbert Griffith, C.B.E., who retired in 1945 from the position of General Manager, Pullman Car Co. Ltd. He was born in 1877, and was educated at Oswestry School; and joined the London & North Western Railway in 1896. In 1902 he was appointed Assistant Divisional Traffic Superintendent on the Egyptian State Railways; he was promoted Assistant to Traffic Manager in 1905; Divisional Traffic Superintendent, Upper Egypt, in 1906; General Traffic Superintendent, Alexandria, in 1909; Goods Manager in 1919; and Deputy General Manager in 1924. Mr. Griffith was appointed General Manager of the Pullman Car Co. Ltd. in 1928.

We regret to record the death on April 5 of Mr. William Oldham, M.Inst.T., a Vice-President, and from 1929-33 Honorary Secretary, of the Mansion House Association on Transport.

The Minister of Supply has appointed Engineer-Vice-Admiral Sir Harold A. Brown as Chairman of the Machine Tool Advisory Council, in succession to Mr. S. F. Steward, who has resigned to give full time to his business interests.

Mr. Cyril M. Cohen, Managing Director of George Cohen, Sons & Co. Ltd., has been appointed Chairman, and remains Managing Director. He succeeds Mr. Lawrence Levy, who has retired from the Chairmanship but remains on the board.

L.M.S.R. Staff Changes

Mr. S. H. Baker, Stationmaster, Dudley, to be Stationmaster, Walsall.

Mr. H. Shaw, District Signalmen's Inspector, District Operating Manager's Office, Birmingham (Western), to be Stationmaster, Dudley.

Mr. W. Wyllie, Railway Service Representative, Commercial Manager's Office, Glasgow, to be Chief Railway Service Representative (Goods), Commercial Manager's Office, Glasgow.

Mr. S. Mason, Inspector (General), Carriage & Wagon Department, Crewe, to be District Foreman, Carriage & Wagon Department, Crewe.

Mr. F. Cowan, District Foreman, Carriage & Wagon Department, Stoke, to be District Foreman, Carriage & Wagon Department, Bradford.

Mr. W. Vickers, Permanent Way Inspector, Oakham, to be Chief Permanent Way Inspector, Barrow.

Mr. R. H. Piggott, Materials Inspector, Signal & Telegraph Engineer's Department, Crewe, to be Works Manager, Signal & Telegraph Engineer's Department, Irvine.

Mr. T. W. Polding, Assistant District Passenger Manager, London, L.M.S.R., who, as recorded in our March 14 issue, has been appointed District Passenger Manager, Leeds, joined the Lancashire & Yorkshire Railway in 1912. During the 1914-18 war he served in France in the Royal Field Artillery. On being demobilised in 1919 he returned to the L.Y.R., in the office of the Superintendent of the Line, and passed from the Goods Train Office to the Personal Section and later to the Excursion Section. In 1928 he was transferred to the Passenger Commercial Superintendent's Office, Derby, to deal with excursion matters. In 1939 Mr. Polding was appointed Chief Excursion Clerk, Chief Commercial Manager's Office, Euston, and from 1940 to 1945 was Acting Assistant (Passenger Services) in the office of the Chief Operating Manager at Watford Headquarters. In 1945 he resumed his former post as Chief Excursion Clerk, in addition to which he acted as Head of the Passenger Revenue Section. He was appointed Assistant District Passenger Manager, London, last year.

A portrait and biography of Mr. R. C. Flowerdew, District Passenger Manager, Leeds, L.M.S.R., who has now been appointed District Passenger Manager, Manchester, appeared in our September 14, 1945, issue.

Colonial Railway Appointments

Mr. D. J. Scott, Senior Engineer, to be Chief Engineer, Gold Coast Government Railway.

Mr. L. C. Gardner, Mechanical Engineer, to be Engineer-in-Chief (Civil & Mechanical), Jamaica Government Railway.

Mr. J. L. F. Fenwick, Engineer, Way & Works Department, to be Assistant Chief Engineer, Way & Works Department, Malayan Railway.

Mr. J. E. A. Foreman to be Assistant Transportation Manager, Malayan Railway.

Mr. J. Astley to be Assistant Engineer, Sierra Leone Government Railway.

Mr. T. W. Eydes to be Assistant Engineer, Tanganyika Government Railways.

Ministry of Transport Accident Report

Marshmoor, L.N.E.R. : November 10, 1946

Lt.-Colonel G. R. S. Wilson, assisted by Brigadier C. A. Langley, inquired into the accident which occurred at about 10.35 p.m. on November 10, 1946, near Marshmoor signal box, between Hatfield and Brookmans Park, L.N.E.R. The 4.45 p.m. express, Newcastle to Kings Cross, composed of 12 bogie vehicles hauled by 2-6-2 "V2" class engine No. 905, became completely derailed, except for the leading pony wheels, about 400 yd. south of Marshmoor box, where it entered an easy right-handed curve. It ran for approximately 295 yd. beyond the first mark of derailment, and all the couplings held. There were screw couplings in front and rear of the leading coach, and buckeye couplers elsewhere. The engine and coaches remained in fair line, and except for the fourth vehicle, which overturned, and the fifth, partly overturned, all came to rest upright or nearly so.

There was a good deal of damage to bogies and undergear. Both bogies became detached from the fourth coach, and its underframe was twisted. Damage to bodywork generally was superficial. The train was lightly loaded. Seven passengers complained of minor injuries and shock.

The up main line was destroyed for 260 yd., and the down main for 100 yd. The slow lines were fouled, but very little damaged. It was a fine night, and had been fairly dry during the preceding week. The diagram on page 398, taken from the report, gives the position of the train after the accident, and other details.

Condition of Track

There is an overall 60-m.p.h. speed restriction south of Hatfield, pending restoration of track to pre-war standard. From 1,072 yd. in rear to 33 yd. ahead of the point of derailment, the up main had been re-sleepered and re-chaired in July, 1946, retaining the 100-lb. R.B.S. rails, very little worn. A further 2 miles, 1,160 yd. had been completely relaid with 110-lb. flat bottom track, which, however, played no part in the derailment.

The curve was aligned to pegs, put in by a fresh survey in April, 1946, with transition length of 90 yd., in which the cant is run up from zero at the tangent point to the designed figure of 2 in. for the circular curve, corresponding, by the L.N.E.R. tables, to an approximate speed of 85 m.p.h. on a 93-ch. curve.

Underlying formation is blue clay, on which layers of slag dust, gravel, etc., have been laid from time to time, owing to continual and long-standing trouble with drainage. Ballast was flint and slag mixture, extending 3 to 4 in. below sleepers. It had been cleared from the ends of a few of the sleepers to drain water out; otherwise they were well boxed in at centres and ends.

Immediately south of the bridge (see plan), there were clear signs of wet, unstable formation. Ridges of clay were working to the surface between up and down main and up main and up slow; the original concrete monuments had become displaced. An old drainpipe had become blocked, and others pushed almost to the surface. There was practically no flow in the drain between up main and up slow. Both drains lead, with ample fall, to a culvert north of the bridge, under which there is a slight dip in the line.

Comprehensive drainage works were being undertaken on the day of the accident (Sunday), and on the three previous Sundays. Formation was being excavated by mechanical shovel from under the down main south of the bridge, and a blanket of sand and ashes was being laid on the clay to a depth of about 2 ft. 7 in. below rail level.

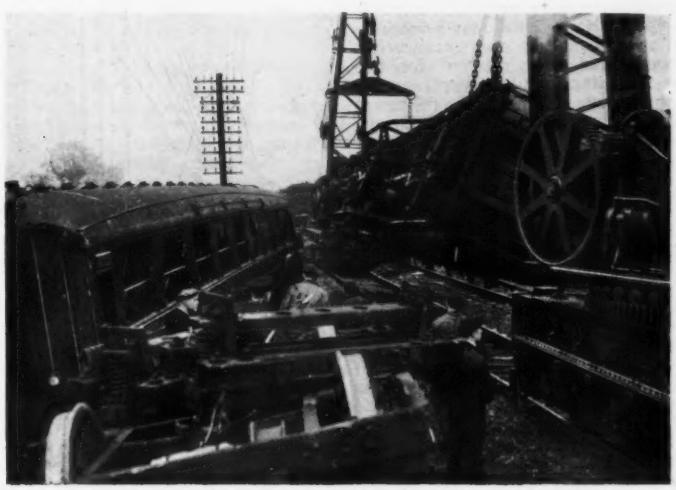
At the same time the drain between the down main and the down slow was being reconstructed with 9-in. earthenware pipes surrounded by brick rubble. It was necessary to dismantle a 60-80-yd. length of the down main each Sunday, after which the track was relaid on the ashes, subject to a speed restriction of 20 m.p.h., pending final settlement and permanent ballasting; there was, however, no restriction on the up main apart from the general 60-m.p.h. limit.

Gauge and superelevation of the up main were measured after the derailment before any work had been done to the track, and the depression of each rail under a slowly moving engine was recorded by void-meters. For 280 yd. in rear of the bridge on the straight plain track, and through a trailing slip connection, the gauge varied from correct to ¼ in. slack, and there was no material variation in the cross level (zero cant). From the tangent point onward, the increase of cant was progressive through the transition for approximately 50 yd., but thereafter there were marked irregularities, which continued almost to the point of the derailment, the first clear indication of which was a mark on a chair key of the low rail. So far as could be seen by eye, the variations in cant were mainly on the high rail.

The diagram shows actual cant measurements, as taken at 45-ft. intervals, compared with the designed cant through the transition and on the circular curve (2 in.) as shown by the dotted line; the drop from 2¼ in. to 1¼ in. in 45 ft., followed by a rise to 2¼ in. in the next 45 ft., will be noted. Void-meter readings showed a maximum depression of ¼ in. At a preliminary examination on the morning after the derailment, Lt.-Colonel Wilson measured the cant at rail joints and middles, noting a drop of 1¼ in. in 30 ft., but this figure was not inconsistent with the company's subsequent measurements taken at a different interval.

The first positive sign of derailment was a deep flange mark on a chair key of the right hand or low rail, followed 3 sleepers further on by broken chairs under both rails. No flange marks on the rails could be traced, but some 21 yd. in rear of the first marked key there was a continuous streak of black grease 4 yd. long on the running edge of the high rail. There was also sinuous distortion of the track without appreciable widening of the gauge, which commenced approximately 54 yd. in rear of the grease mark on the high rail and 75 yd. in rear of the first marked key on the low rail. The extent and direction of this distortion were similar to, but not so pronounced as, that in the Hatfield derailment on July 15, 1946.

From the first broken chairs onwards there were marks on the chairs, evidently caused by wheels running derailed to the right within a few inches of the track alignment. These continued up to the joints with the flat-bottom track which were burst asunder. Fortunately, the pony wheels held the engine to within a foot or so of track alignment; this, and the restraining effect of the buckeye couplings, kept the train more or less in line and also undoubtedly prevented more serious results.



General view after the accident at Marshmoor, L.N.E.R.

Engine No. 905 was similar in all material respects to the one involved at Hatfield. There was no material defect in it prior to the accident, and it was practically undamaged. On examination at Doncaster all axles were found to be true and no axlebox was binding. Wear in the pony swing link bushes had not affected side control. Bearing springs were in good condition, except that one of the 4-coil springs of the pony axle was found to have been broken for some time, but still had been carrying its load. Weight distribution was reasonably satisfactory, with approximately 1 ton less than standard on the pony truck and 1 ton more on the leading coupled axle.

Except for the pony axle spring, the engine appeared to be in normal condition generally, having regard to mileage run since the last general repair. Increase in axle side play was not excessive, but there was about ¼ in. additional uncontrolled movement in the Cartazzi axle. There was considerable increase in side

play of the tender axles, but this was not regarded as abnormal.

The train passed Huntingdon 24 min. late, and had a clear run thereafter. The driver said that the engine was in good condition. He had no difficulty in keeping or regaining time. Experiencing severe rolling at Hatfield, he shut off steam and was about to apply the brake, but the engine steadied down. He coasted for ¼ mile and opened the regulator to the first valve for the 1 in 200 up to Potters Bar. Travelling at about 50 m.p.h.—perhaps a little more—through the bridge at Marshmoor, the engine gave a sudden heavy lurch to the right and was derailed.

The Marshmoor signalman thought the train was travelling faster than those passing on the up main since 6 p.m. when he came on duty, and mentioned 70 m.p.h., but Lt.-Colonel Wilson sees no reason to disbelieve the driver and concludes that speed was probably about 55 m.p.h. According to the driver, it had been well known for many years that rough riding was to be expected on both main lines at the site, particularly after wet weather; other drivers confirmed this.

Reports of lurches there had been received from time to time. On each occasion the track was examined at once, and line and level corrected if necessary. Marshmoor distant signal was sometimes kept at caution pending such examination. No reports had been received for two months preceding the derailment.

Statements were furnished by drivers of the five expresses which preceded the derailed train, the first of which passed at 7.45 p.m. Its driver said he "felt a violent lurch." The next "felt nothing serious"; the third "got a lurch and a roll"; the fourth "a bit of a kick, which was not too serious," while the fifth, who passed 15 min. before the accident, asserted that he "felt three successive lurches on the first 100 yd. from the bridge, not travelling more than 40 m.p.h." A passenger in the train prior to that reported an unusually violent lurch.

The District Engineer, Chief Permanent Way Inspector, and his inspector, with the ganger, unanimously declared that up and down main lines south of the bridge had been troublesome for some time. Some clay was removed from the down main about 18 years ago, and a blanket of slag dust laid on the formation; new drains were then put in.

The ganger referred to steps taken about 10 years ago to reinforce the up main by inserting longitudinals under the sleepers opposite the hut (see plan). Level of both main lines for 300 to 400 yd. south of the bridge required constant attention and he always examined it on coming on duty. A few weeks before he had driven three stakes against the sleeper ends, on the outside of the curve, to try and keep the up main in place, with little effect.

The unsatisfactory conditions had thus been recognised for some time, but drainage works there and at other points in the clay formation in the London area had to be postponed owing to shortage of labour during the war. This, and the accumulated arrears of track renewals, were factors in the company's decision to retain the general wartime restriction of 60 m.p.h. south of Hatfield when it was raised in November, 1945, to 70 m.p.h. on other sections of the main line. During 1946, however, approximately 25 per cent. of the main line track mileage south of Hatfield has been renewed, and comprehensive drainage works were in progress at the time of the derailment. The District Engineer had realised their necessity ever

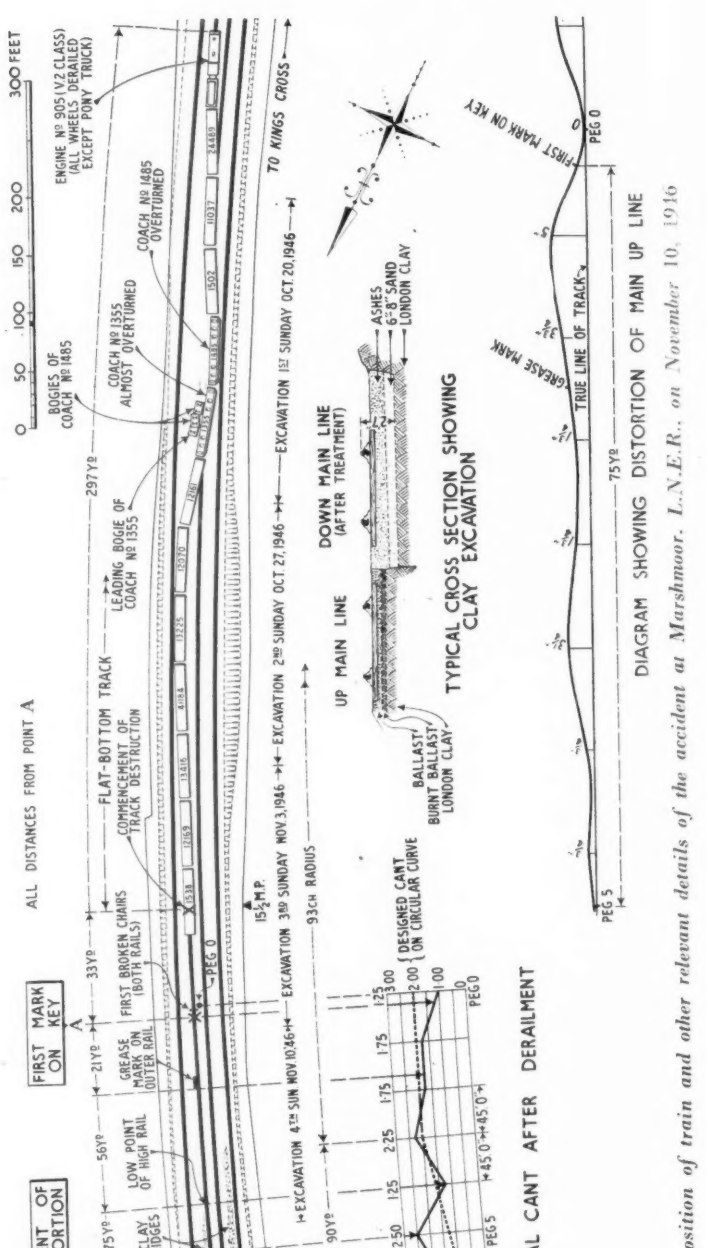


Diagram showing position of train and other relevant details of the accident at Marshmoor, L.N.E.R., on November 10, 1946

since he assumed charge of the district in 1941, and had taken them in hand directly men were available.

Attention was first given to the down main, as it was considered to be in the worse condition. Work was started on October 20, proceeding northward on successive Sundays, and on November 10 a 60-yd. length was dismantled opposite to the point where the derailment occurred a few hours later. Possession was taken of both lines, and as the formation was excavated down to the firm clay, the sand and ash layers were tipped from wagons standing on the up main. By 4.30 p.m. the track had been replaced on the ashes and roughly levelled, after which both lines were handed back to traffic with a 20-m.p.h. speed restriction on the down main; a gang was left on duty to watch for possible settlement during the night.

Before traffic was resumed, the permanent way inspector and relaying ganger examined the up main and found it necessary to make some slight adjustments to alignment and cross level, packing about 18 sleepers under the high rail at the worst place where the clay was working up. When this was done, the ganger was satisfied that the track was "safe for normal express running." This was confirmed by the inspector.

Arrangements had been made in the first instance for a continuous speed restriction on the up main during the course of the work on the down main, and the restriction had been included in the relevant traffic notices; on October 27, however, the clay under the up main was found to be firmer and drier than expected, and the restriction was withdrawn on October 29. When Lt.-Colonel Wilson visited the site on December 8, excavation of the down main was proceeding just north of the bridge. He found the clay surface to be of the consistency of stiff plasticine; it was damp, and water was trickling through at one point from under the up main. There was also a good deal of water in a pit which had been dug to ascertain the depth of the bridge pier foundations between the down main and the down slow.

The District Engineer and Chief Permanent Way Inspector felt fully justified in withdrawing the speed restriction on the up main, considering its stability not to have been affected by excavation of the down main. If this had been so, the *low* rail would have gone down under traffic; this had not been the case to any marked extent, and the irregularity of cant which was found after the accident had been due to subsidence of the *high* rail, which was comparatively remote from the excavation. They agreed, however, that with irregularity of this order, the track would have been unsafe for traffic without a severe speed restriction.

Inspecting Officer's Conclusion

Although Lt.-Colonel Wilson has no hesitation in accepting the statements that the up main was left in satisfactory alignment and cross level on finishing work at 4.30 p.m., that condition was not maintained, and by 7.45 p.m. a violent lurch was experienced on a train passing at 55 to 60 m.p.h. Other drivers then felt lurching, until at 10.20 p.m. one felt three successive lurches. At 10.35 p.m. the disturbance to the engine running at 55 m.p.h. was sufficient to cause derailment.

The character and comparatively slight extent of the damage to the track for the first 33 yd. up to the broken joints where complete destruction began, may be accepted as proof that derailment to the right was initiated by the leading coupled wheels. There were, however, no flange marks on the surface of the low rail, suggesting that the weight on the right hand side must have been relieved by severe rolling, set up by the irregular cross level towards the end of the transition curve; with this relief of weight, derailment probably resulted as the leading coupled wheels were thrusting to the right under the violent side nosing action which accompanied the rolling and was responsible for the track distortion.

The irregularity in cross level was of far different order from the comparatively minor variations at Hatfield, and was clearly the primary cause of the derailment. Other features, however, bore a marked resemblance, namely, the preliminary track distortion and the fact that the leading pony wheels were not derailed, and they add some confirmation to the conclusion in the Hatfield case that engines of this class may be more than ordinarily sensitive to track defects. Indeed, it is likely that at Marshmoor, also, disturbance caused by the irregular cant may have led to excessive flange pressure at the leading coupled wheels, under the comparatively light and undamped side control of the swing link pony truck, which had been further diminished by normal wear of flanges and axlebox faces; there was also some additional freedom at the rear Cartazzi axle.

The track recently had been relaid, and Lt.-Colonel Wilson is satisfied that the ganger had given it conscientious attention, while his superiors had realised that the trouble was passing beyond control by ordinary maintenance, so that measures to remedy foundation weakness were in progress. He thinks, however, that it had not been fully appreciated how far the margin of safety had diminished within recent months, following the wet summer, having regard especially to the characteristics of the "V2" engines.

All the evidence suggested that the foundation of the up main had not been fit even for 60 m.p.h. for some time, but he is not prepared to express an opinion whether that had been weakened by the excavation of the adjacent down main to within 15 in. or so of the ends of the sleepers. This possibility had not been overlooked, and arrangements had been made in the first instance for a continuous speed restriction on the up main during the course of the work; it had been withdrawn only after careful examination of the exposed formation. As events proved, it would have been wiser to retain it, but in fairness to the engineering staff it should be borne in mind that local speed restrictions, additional to those required in the ordinary course of track renewals, have a particularly adverse effect on traffic at the present time, already seriously handicapped by difficulties in locomotive maintenance and poor-quality coal.

Though track defects were the primary cause, this derailment and that at Hatfield have drawn attention to the behaviour of the "V2" engines in relation to such defects, or even to comparatively minor imperfections in alignment and cross level. Improvement of the pony truck side control was recommended in Lt.-Colonel Wilson's report on the Hatfield case, and the company is experimenting in this direction, having already abandoned the swing link arrangement in favour of spring control in new designs.

A number of "V2" engines are being fitted with a spring-controlled pony truck, similarly to the new 2-6-4 type tank engines, and the weight is taken by side bearing pads; there will thus be some damping effect, and the arrangement generally should result in a more satisfactory distribution of the flange forces, particularly as the springs can be set to provide some initial control. Maintenance also should be simplified, as the heavily loaded pins and bushes of the swing links are difficult to lubricate satisfactorily, and are subject to considerable wear.

One engine has been altered already; 25 more will be dealt with as the necessary equipment, which has been ordered, becomes available; the trial will thus be on a considerable scale, and when it has proved itself, a decision will be taken on the alteration of the remaining engines. As a longer term policy, the company is building a number of Pacific type engines, some with 6-ft. 8-in. and others with 6-ft. 2-in. coupled wheels, which will enable a corresponding number of "V2" engines to be released from express work.

In the meantime, the majority of the class will be running in their original condition, and as it is not practicable at present to discontinue their employment on express trains, the position is being dealt with by a more rigorous policy of local speed restriction, following a close review of the more troublesome sections of the track; in spite of the effect on traffic, a restriction of 20 m.p.h. has been imposed at Marshmoor, pending completion of the drainage work, also at several other points, including Hatfield, on the main line south of Doncaster. At the same time, special attention is being given to these weak points, which are largely the result of arrears of maintenance.

Diagram showing position of train and cant

A Permanent Engineering Centre

Late this summer there will be opened at Glasgow the first branch of The Engineering Centre, which will serve the purpose of a permanent exhibition of engineering products, where firms will be encouraged to display their goods in succession. The essence of the scheme will be to provide opportunities for visual study of the latest engineering equipment, developments, materials, etc., without the embarrassment of salesmanship in any active form, and eventually some 400-500 firms will be represented at each branch of the centre. Already the scheme has the support of 40 technical institutions and more than 100 firms.

The exhibits will comprise appliances, machinery, tools, materials, etc., from all parts of the world, but preference will be given to British Empire products. Facilities will be provided for manufacturers to bring their goods to the notice of engineers, consultants, foreign buyers, and Government departments, etc.

Much importance is attached to the advisory bureau. At all times, there will be a technical staff available to furnish factual information, and a library of technical periodicals will be maintained.

Major Jackson Miller, Chairman, Albion Motors Limited, is Chairman of the private company formed to develop the new project, and the Vice-Chairman is Mr. E. Bruce Ball, Managing Director, Glenfield & Kennedy Limited. Mr. G. Gordon Jackson, formerly Progress Officer, Scottish Industrial Estates Limited, is the Managing Director, with headquarters at 351, Sauchiehall Street, Glasgow, C.2. Other directors are Professor W. M. Cumming, Royal Technical College, Glasgow; Mr. Iain M. Stewart, Managing Director, Thermotank Limited; and Mr. E. G. Wylie, A.R.I.B.A.

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Questions in Parliament

Railway Dividends

Mr. A. C. Bossom (Maidstone—C.) on February 4 asked the Minister of Transport if he would state the total amount the holders of the so-called Big Four railway securities had received in dividends in 1944, 1945, and 1946; and how much they would receive under the new scheme when it came into force.

Mr. G. R. Strauss (Parliamentary Secretary to the Ministry of Transport), in a written answer, stated: The total amount of interest and dividends paid by the four main-line railway companies on their loans, debenture, guaranteed, preference, and ordinary stocks for the years 1944 and 1945 were approximately £40 millions and £42 millions respectively. Figures for the year 1946 are not yet available. The amount of British Transport Stock to be issued in exchange for the existing securities of the four main-line railway companies, and the rate of interest it will carry, will be decided by the Treasury at the date of issue of the stock. Meanwhile, I am unable to estimate the total amount of interest which will be payable to the holders.

Accidents on L.N.E.R.

Mr. Hector Hughes (Aberdeen North—Lab.) on March 24 asked the Minister of Transport if his attention had been drawn to the report of his department's Inspecting Officer of Railways on the accidents on the L.N.E.R. in July, 1946, and on November 10, 1946, when considerable loss and damage had occurred; and what steps he had taken, and would take, to obviate such avoidable accidents and to ensure the safety of the travelling public.

Mr. Alfred Barnes (Minister of Transport), in a written answer, stated: Yes. The steps which are being taken to prevent similar accidents are those mentioned at the end of the report on the accident at Marshmoor on November 10.

Train Men Leaving During Journey

Lieutenant William Shepherd (Bucklow—C.) on February 24 asked the Minister of Transport how many train men had abandoned their trains during the course of a journey in the months of November and December, 1946; and if he would give a comparable figure for the year 1945.

Mr. Alfred Barnes said that 319 train men had left their trains during the course of journeys in November and December, 1946. In the same two months of 1945 the number had been 251.

Lieutenant Shepherd: Is the Minister able to tell us what he is going to do about this increasing practice? Surely, it is something to which he should give his immediate attention?

Mr. Barnes: The gravity of this matter is, of course, appreciated, but in most cases the men had already done a full shift, and that is part of the problem of keeping the flow of men going under present conditions.

Mr. J. A. Sparks (Acton—Lab.): Is the Minister aware that many of these men have worked very excessive hours of duty and that, had they not left their trains, they would have been unable to perform their next turn of duty; and, further, that, in many cases this action is taken with the knowledge of the control office concerned?

Mr. Barnes: Yes, I have had a few taken off. In one case, the men had worked a continuous duty of 17 hours.

Mr. W. T. Proctor (Eccles—Lab.): Is the Minister aware that the word "abandoned" is used in the question, whereas the Minister himself in his answer used the word "left"? Is not the usual procedure to leave trains in sidings, properly controlled, and the case that, if a train crew abandoned their train, it would have very serious consequences as far as the railway system is concerned? In the cases referred to, were the trains abandoned, or merely left in the sidings in the normal way?

Mr. Barnes: I cannot, of course, control the language in which a question is put down, and the whole problem is really too complex and involved to answer by way of supplementary questions.

Lieutenant Shepherd: Is it not a fact that these men do abandon the trains and that they are brought before the superintendent of the area and receive three days suspension which, in view of P.A.Y.E., they are pleased to receive?

Mr. Barnes did not reply.

Electrification of Railways

Mr. A. J. Champion (Derby Southern—Lab.) on March 24 asked the Minister of Transport if he had considered the effect of the further electrification of parts of the Southern Railway in the light of the shortage of generating equipment; and if he was prepared to make a statement of the Government's policy on the immediate and long-term programme of electrification of the railways generally.

Mr. Alfred Barnes, in a written answer, stated: I have the Southern Railway Company's proposals under consideration and the point raised by Mr. Champion will be borne in mind. It is premature to make a statement with regard to railway traction generally.

Restricted Railway Services and Staggered Holidays

Mr. J. A. Sparks (Acton—Lab.) on March 31 asked the Minister of Transport, in view of the recent announcement that restricted summer services would operate on the four main-line railways, what arrangements he proposed to cope with the holiday traffic which promised to be greater this year than last year.

Mr. Alfred Barnes: The summer timetables are now being worked out. The reduction of services that will be necessary is bound to result in inconvenience to the travelling public, and will make it more important than ever for workers and employers to co-operate to secure the fullest possible staggering of holidays. All who can do so should avoid travelling at weekends.

Mr. Sparks: Will the Minister take steps to make this widely known throughout industry, because the congestion on the railways last year was very serious and it will be very much worse this summer? Will the Minister see that this is given the widest publicity?

Mr. Barnes: My department is always stressing the need for staggering, and will continue to do so.

Mr. Evelyn Walkden (Doncaster—Lab.): Is not the Minister aware that the so-called 10 per cent. cut as far as the railway companies are concerned means a cut of 40, 50, and 60 per cent. in the services to certain seaside resorts in different parts of Britain, and will he have a look at that matter?

Mr. Barnes: No, I do not accept those percentages.

Mr. Walkden: The figures have been sent to the Minister already.

Mr. Sparks: Is the Minister aware that the Minister of Labour, in reply to a question of mine the other day, said it was impossible to get an agreement between the workpeople and the managements on the arranging of mid-week to mid-week holidays during the holiday period, and that the week-end period was the one generally accepted in industry because of the dislocation that would otherwise arise; and, in view of those facts, could he not persuade the Minister of Labour to reconsider this matter?

Mr. Barnes: I am aware of the position and that is why we are keeping up the pressure in the opposite direction.

Rail Transport Difficulties and Coal Output Loss

Sir Ralph Glyn (Abingdon—C.) on March 24 asked the Minister of Transport what had been the actual loss of coal output from collieries for the years 1946, 1945, and 1944, due to the inability of the railway companies to move it.

Mr. Alfred Barnes, in a written answer, stated: The loss of coal output through rail transport difficulties in these years was approximately as follows: 1944, 588,000 tons; 1945, 617,000 tons; 1946, 350,000 tons.

Transport and Staggered Hours

Mr. J. A. Sparks (Acton—Lab.) on March 24 asked the Minister of Transport what arrangements had been made to provide transport for workers engaged on staggered hours of duty, including night-work, arising from the resumption of work in industry following the fuel crisis.

Mr. Alfred Barnes in a written answer stated: The Regional Boards for Industry and their district committees consult the transport undertakings concerned, so that the necessary adjustments may be made in the transport services. The Area Traffic Commissioners and the railway companies are giving full co-operation.

Posting Facilities on Mail Trains

Mr. W. A. Wilkins (Bristol South—Lab.) on February 5 asked the Assistant Postmaster-General whether he would now restore the pre-war late-fee posting facilities on Post Office carriages attached to mail trains, particularly the 7.20 p.m. Bristol—York express.

Mr. W. A. Burke (Assistant Postmaster-General): No. I regret that in view of the present manpower difficulties the restoration of late-fee posting facilities is not possible.

Mr. Wilkins: Is it not a fact that sorting staff are already on these coaches; consequently, what difficulties are there in restoring these facilities?

Mr. Burke: Our present policy is to raise the general level of the postal services throughout the country, and this would not further that policy.

Mr. Wilkins: I do not think that that quite answers my question. I am asking whether it is not a fact that sorting staff are already available to undertake this service?

Mr. Burke: Yes. They are available on the coaches, but they are not able to cope with any extra work.

Transport to Ireland

Sir Ronald Ross (Londonderry—C.) on March 24 asked the Minister of Transport whether he was aware that, by substituting the R.M.S. *Princess Victoria* for the R.M.S. *Princess Margaret* on the Larne-Stranraer route, he was further reducing an already diminished means of transport to Ireland, and, further, that he was depriving third class passengers by that service of their sleeping accommodation; and what action he proposed to take to restore that accommodation.

Mr. Alfred Barnes, in a written answer, stated: This substitution has not reduced the total carrying capacity. Sleeping accommodation for third class passengers is not provided, but on account of the short journey the demand for such accommodation is small. By substituting the *Princess Victoria* there is a saving of 260 tons of coal a week.

Staff and Labour Matters

Railway Staff Return, 1946

The particulars issued by the Ministry of Transport of the staff employed by the railway companies of Great Britain and the railway staff of the London Passenger Transport Board during the week ended March 9, 1946, compared with the week ended March 10, 1945, represent, like those issued last year, an abridged version of the pre-war reports. The figures for March 10, 1945, were given in our May 24, 1946, issue.

The number of persons employed is computed on the usual basis, and represents the number receiving salaries or wages for the full week combined with the equivalent number of full-time workers where the employees were paid for less than the complete week.

The numbers employed in the various departments in the periods concerned were:—

	March, 1946	March, 1945
Men	546,859	499,770
Youths and boys ...	32,737	31,292
Women	67,686	85,473
Girls	4,971	5,834
Total ...	652,253	622,369

The reduction in the numbers of women employed took place in the clerical, conciliation, and workshop grades, but the loss was more than made good by the additional male staff in those grades. The numbers of persons employed in the principal grades in March, 1946, were as follow:—

Grade	Male	Female
Capstanmen	905	77
Carters and van guards	19,696	1,986
Carriage cleaners	4,250	3,764
Carriage and wagon examiners ...	4,209	—
Carriage and wagon oilers and greasers	1,615	264
Checkers	10,222	413
Cranemen	741	12
Crossing keepers	1,344	1,606
Engine cleaners	5,223	940
Engine drivers and motormen ...	43,716	—
Firemen and assistant motormen	39,307	—
Foremen and chargemen ...	7,573	133
Guards (goods)	18,284	2
Guards (passenger)	6,802	582
Hydraulic and pumping engine staff	675	7
Labourers	25,964	1,950
Lampmen	1,472	72
Loaders, callers off, ropers, and sheeters	5,802	560
Locomotive shed staff (excluding labourers)	10,936	345
Messengers	839	143
Number-takers	1,767	207
Officers and clerical staff ...	47,665	28,459
Permanent way men	54,618	518
Pointsmen	258	10
Police staff, supervisory grades ...	592	—
Police staff, other grades... ...	3,573	165
Porters (goods)	15,802	4,983
Porters (passenger)	28,178	6,554
Porter guards	345	173
Porter Signalmen	1,540	162
Shop and artisan staff, supervisory grades	2,937	34
Shop and artisan staff, other grades (excluding labourers and watchmen)	98,216	3,508
Shunters	19,476	12
Shunt horse drivers	147	—
Signal and telegraphmen ...	7,466	7
Signalmen	23,993	779
Signalbox lads	1,769	89
Stationmasters, yardmasters, etc.	5,484	—
Supervisory staff (other than shop, artisan, and police) ...	11,474	138
Technical staff	3,898	—
Ticket collectors	3,531	920
Traffic control staff	2,167	—
Watchmen	444	—
Miscellaneous grades	8,605	6,105
Ancilliary businesses	26,275	7,048
Totals	579,596	72,657

The average earnings, which exclude workpeople who were receiving full or partial board and lodgings and part-time staff, are given as follow:—

WAGES GRADES

	Week ended March 9, 1946	Week ended March 10, 1945
	s. d.	s. d.
Men		
Conciliation staff	117 10	111 3
Shop and artisan staff ...	132 5	131 7
Other staff	124 6	131 1
All men ...	121 6	116 10
Youths and boys		
Conciliation staff	45 7	41 11
Shop and artisan staff ...	46 5	43 0
Other staff	43 8	41 0
All youths and boys	45 9	42 3
Women		
Conciliation staff	88 5	80 7
Shop and artisan staff ...	92 7	91 2
Other staff	68 9	69 10
All women ...	88 4	82 8
Girls		
Conciliation staff	47 10	44 3
Shop and artisan staff ...	48 0	53 10
Other staff	*	*
All girls ...	47 10	48 8

* The number employed was insufficient to provide a satisfactory basis for averages

SALARIED GRADES

Men		
Clerical, supervisory, etc. (exclusive of officers) ...	146 5	143 6

The total salaries and wages paid in the year ended December 31, 1945, was £186,425,396, an increase of almost £6 million over 1944.

Irish Transport Company

The annual general meeting of Corás Iompair Eireann (Irish Transport Company) was held in Dublin on March 20, Mr. A. P. Reynolds, Chairman of the company, presiding.

The Chairman, in moving the adoption of the report and accounts, said that when he spoke last year he expected better deliveries of essential materials than they had received, and he did not anticipate so sharp and rapid a rise in costs. Of their wages and salaries increase of £762,000 referred to in the directors' report, only £386,464 was for increase in rates of pay, and in a full normal year it was estimated that these increases would add £1 million to their expenditure.

There were also increases in such items of expenditure as maintenance of permanent way and rolling stock, because materials—timber, rails, sleepers, and such like—heretofore not procurable, became available. They would have noted that coal cost only £52,695 more than in the previous year, but additional mileage cost £126,000 for coal alone, and there would have been a saving on this item if the miles operated in each of the two years were the same, or if the quality of the coal had not further deteriorated in the last quarter of the year.

A large portion of the additional miles were run on branch lines. An undertaking was given that the services closed during the emergency would be re-opened when it ended, and they had to re-open them. There was now no doubt that all uneconomic lines must be permanently closed except where it was necessary to use them occasionally for heavy traffics.

Gross revenue did not decrease by reason of the reduction in rates and fares as much as was anticipated. At the same time, it should be noted that the additional miles run on railways did not produce sufficient revenue to justify them. On the other hand, results justified the additional miles run by omnibuses. The more serious losses in revenue, however, were caused by the effect of the weather, and by the beet workers' strike.

Last year, discussing a reduction in rates and fares, he had said that if this policy involved a permanent loss, they would devise means to make it good. They did not experience actual loss last year, but were now suffering very heavy losses as a result of the coal crisis and the bad weather. This was a temporary setback, but there was nothing temporary about the increase in rates of pay, and to meet this permanent additional burden they must increase rates and fares. They proposed to put the railway goods rate up by 20 per cent. Passenger fares on railways and provincial omnibus services would be increased so as to produce 1·5d. instead of 1·3d. per passenger-mile as at present; return tickets would be withdrawn, and the 1½d. fare would be re-introduced on city omnibus services. There would be increases also in the Dalkey tram, Bray omnibus, and suburban rail fares.

While they did not anticipate that supplies of coal would cease altogether, they did foresee a coal crisis, and as soon as materials became available they began to convert steam engines from coal to oil burning. This work was held up by the fitters' strike, and they were now converting at the rate of three engines a week. The fitters' strike was unreasonable and unnecessary. These men made extravagant demands and accompanied them with strike notice. There were no negotiations—the Labour Court intervened and, although an undertaking was given that the company would accept the Court's recommendations and pay retrospectively, the men were called out on strike. When the Court awarded a rate of 2s. 11d. an hour, the men still held out for the "down-town" rate, which had been fixed at 3s. an hour.

It should be explained that, while paying the "down-town" by-the-hour rate, the employer, in the event of redundancy, had the right to dismiss any man in his employment at an hour's notice. There was no security. Under what had become known as "company's conditions," employees had security. When the fitters and turners refused to return to work, the company had no option but to withdraw these conditions from all craft workers.

Last year, the Chairman had outlined what they hoped to achieve. They were to have begun experiments with diesel-electric locomotives. Unfortunately, their suppliers had been unable to deliver on contract, and they could not begin experimenting for some months yet. Plans for the new wagon shops to be built at Limerick were being considered, and, in the meantime, they built 300 new wagons and repaired some 4,500 others during the year.

During the year, 30 new omnibuses, 120 new lorries, and 70 trailers were put into service, and new road vehicles would continue to come into service at the rate of six a week.

In order to finance their long-term programme they had, with the approval of the Minister for Industry & Commerce, created £3,110,917 2½ per cent. 1965-75 guaranteed debenture stock, the money to be made available to them as and when required. In this way they would avoid paying interest on loan capital for which they had no immediate use.

The report and accounts were adopted.

Notes and News

Temporary Technical Assistants Required.—Temporary technical assistants are required for a railway signal engineer's office in Edinburgh. See Official Notices on page 403.

L.M.S.R. Debentures.—A balance of the L.M.S.R. 5 per cent. debenture stock is to be struck at the close of business on April 24.

Commercial Engineer Required.—A railway supply firm in London requires a commercial engineer. See Official Notices on page 403.

Coppersmith Foreman Required.—The Sudan Government Railways require a coppersmith foreman, age 30-37, for service in the Sudan, to take charge of the Atbara Works coppersmith shop. Applicants should preferably have served their apprenticeship in a railway works, or shop engaged on similar varied work. See Official Notices on page 403.

Diesel Tug for L.M.S.R.—An order has been placed by the L.M.S.R. with Richard Dunston Limited, Thorne, Doncaster, for a twin-screw diesel tug for use in Wyre Docks, Fleetwood. The new vessel, which will have an overall length of 75 ft. and a breadth of 16 ft. and depth of 9 ft., will be fitted with two Ruston & Hornsby six-cylinder VCBM diesel engines having oil-operated reverse reduction gear. The tug also will have two fire and salvage pumps, capacity 350 gal. per minute each, driven by the main engines. Delivery of the tug is expected in about 15 months.

American Decoration for Mr. K. W. C. Grand.—On April 10, at the residence of the United States Ambassador in London, Mr. K. W. C. Grand, Assistant General Manager, G.W.R., was presented with the Medal of Freedom, with Bronze Palm, for his services to the United States during the war. In the photograph reproduced below, Mr. Grand is seen talking with Mr. Lewis Douglas, American Ambassador, and Major-General Clayton D. Bissell. Mr. Grand is well known in United States railway circles. For some years before the war, he was the G.W.R. agent in the U.S.A., and during the war, he was closely associated with General Ross and General Dee, who were responsible for the transportation of United States troops in Great Britain.

Thos. Cook & Son Newcastle Manager.—Mr. C. J. Seward has been appointed Manager of the Newcastle Branch of Thos. Cook & Son Ltd. He entered the company's service 25 years ago, and has recently rejoined it after having served as Deputy Regional Coal Officer, North Eastern Region.

Dorman, Long Central Engineering and Plant Construction Departments.—Dorman, Long & Co. Ltd. has converted the large hall which was formerly the home of Middlesbrough Exchange into a drawing office for the company's Central Engineering and Plant Construction Departments. Mr. F. L. Smith has been appointed Chief Technical Engineer in charge of the Central Engineering Department, and Mr. H. C. Cronk, Chief Engineer of the Plant Construction Department.

Barsi Light Railway Co. Ltd.—At the general meeting of the Barsi Light Railway Co. Ltd., the Chairman, Sir E. A. S. Bell, said that the year 1945-46 had passed all previous records. After providing for all taxation, the board was able to increase the renewals reserve by £10,000, bringing it up to £42,500, and to pay 6½ per cent. on the ordinary stock. A request had been made to the Railway Board in India for suitable men to fill vacancies on the company's system, but the board had replied that none of its younger men could be spared, and was able only to suggest the names of those who had retired already or were on the point of doing so. It seemed likely, therefore, that any officers engaged by the company would be able to serve only for a year or two, after which similar difficulties would again be faced. The company had, however, inquired whether the Railway Board would be prepared to take over the working of the system through the agency of one of the Indian State Railways, and a reply was now awaited. It was considered that if the Railway Board agreed to the suggestion, the position and prospects of the stockholders were not likely to be affected.

North British Locomotives for South Africa.—The North British Locomotive Co. Ltd., Glasgow, has received recently an order to build 100 2-8-4 type "24" class locomotives for the South African

American Decoration for Mr. K. W. C. Grand

Mr. Lewis Douglas, American Ambassador, and Major-General Clayton D. Bissell, with Mr. K. W. C. Grand, Assistant General Manager, G.W.R., after Mr. Grand had been decorated with the United States Medal of Freedom (see paragraph above)

British and Irish Railway Stocks and Shares

Stocks	Highest 1946	Lowest 1946	Prices Apr. 15, 1947	Prices Rise Fall
G.W.R.				
Cons. Ord.	61½	54½	55	+ ½
5% Con. Pref. ...	126½	107	121½	+ 1
5% Red. Pref. (1950)	106½	102½	102½	—
5% Rt. Charge ...	140½	122½	135½	+ 1
5% Cons. Guar. ...	137½	118½	132½	+ 1
4% Deb.	129½	106	124½	+ 1
4½% Deb.	129½	107	124½	+ 1
4½% Deb.	130½	114	125½	—
5% Deb.	142½	125	137½	—
2½% Deb.	95¼	81½	92½	—
L.M.S.R.				
Ord.	30½	26½	27¼	—
4% Pref. (1923) ...	64	52½	59½	—
4% Pref.	86	75½	80½	—
5% Red. Pref. (1955)	105½	97	101½	—
4% Guar.	108½	100	102½	—
4% Deb.	120	103	113½	—
5% Red. Deb. (1952)	108½	105½	105½	—
L.N.E.R.				
5% Pref. Ord. ...	7	5	6⅝	—
Def. Ord.	3½	2½	3¼	—
4% First Pref. ...	59½	50½	54½	—
4% Second Pref. ...	29½	25⅝	27	—
5% Red. Pref. (1955)	104	97	98½	—
4% First Guar. ...	107	98	101½	—
4% Second Guar. ...	101	90	95½	—
3% Deb.	104	87½	98½	+ ½
4% Deb.	119½	102½	113½	—
4½% Sinking Fund Red. Deb.	107½	101½	103½	—
SOUTHERN				
Pref. Ord.	79½	70	73½	—
Def. Ord.	24	19½	22½	—
5% Pref.	125½	107	120½	+ 1
5% Red. Pref. (1964)	115½	106½	111½	—
5% Guar. Pref. ...	137½	119	132½	+ 1
5% Red. Guar. Pref. (1957)	115½	107½	111½	—
4% Deb.	129½	105½	124½	+ 1
5% Deb.	159½	125½	135½	+ 1
4% Red. Deb. (1962-67)	113½	104½	110½	—
4% Red. Deb. (1970-80)	115½	104½	111½	—
FORTH BRIDGE				
4% Deb.	109	103	103½	—
4% Guar.	105	102	99½	—
L.P.T.B.				
4½ "A"	133½	120½	128½	+ 1
5% "A"	142½	130½	137½	+ 1
3% Guar. (1967-72) ...	108	98½	104½	—
5% "B"	128½	117½	124½	+ 1
"C"	64½	56½	62½	—
MERSEY				
Ord.	34	30	34½	+ ½
3% Perp. Pref. ...	76	69	72½	—
4% Perp. Deb. ...	117½	103	111	—
3% Perp. Deb. ...	98	81	92½	—
IRELAND*				
BELFAST & C.D.				
Ord.	8⅛	6	7½	—
G. NORTHERN				
Ord.	41⅞	30½	31½	—
Pref.	63⅛	52	50½	—
Guar.	97½	78½	90	—
Deb.	107	97½	104½	—
IRISH TRANSPORT				
Common	19/2½	16/9	15/–	—
3% Deb.	107	100	104½	—

* Latest available quotation

OFFICIAL NOTICES

WANTED for Railway Signal Engineer's Office in Edinburgh: Temporary Technical Assistants with experience in preparation of schemes, plans, diagrams and estimates for Mechanical and/or Electrical Signalling. State age, qualifications, and salary expected to Box 99, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

CORAS IOMPAIR EIREANN require Assistant to District Railway Engineer (Civil). Permanent appointment. Pensionable. Salary £450 by £20 per annum to £630. Must be A.M.I.C.E. or A.M.I.C.E.I., or hold Civil Engineering Degree, and must have five years' experience railway permanent way and works maintenance. Applicants, who will be required to attend for personal interview, should apply in writing, giving full particulars to: CHIEF ENGINEER, CORAS IOMPAIR EIREANN, Westland Row Station, Dublin.

FORDELL RAILWAY. The history of this Scottish Waggonway, now over 175 years old. 32 pp. art paper. 9½ in. × 7½ in. 33 postcard-size illustrations and folding map. Price 4s. 6d. post free, from DR. INGLIS, The Colony, Larbert, Stirlingshire.

LONGMOOR MILITARY RAILWAY. Transportation Training Centre of the Corps of Royal Engineers. Reprint of an article published in *The Railway Gazette*, July 5, 1946. 22 pp. 9 in. by 6 in. Illustrated. In paper cover, 2s. *By post* 2s. 3d.

Sudan Government

SUDAN GOVERNMENT RAILWAYS require a Coppersmith Foreman, age 30-37, for service in the Sudan, to take charge of the Atbara Works Coppersmith Shop. The work undertaken includes pipe bending of a very varied nature, sheet-metal work, white metalling and general locomotive coppersmithing. Applicants should preferably have served their apprenticeship in a railway works, or shop engaged on similar varied work. Experience in a foundry would be an added recommendation.

Salary scale for the post is £E.420-460-500-560-630-700 (biennial increases), with one further increase to £E.770, if efficiency bar not passed after £E.560. If efficiency bar passed, scale extended after £E.700 by two biennial increments of £E.70 and one triennial increment of £E.80 to £E.920 maximum. Starting rate would be determined according to age, qualifications and experience.

Appointment on Provident Fund Contract, with security for seven years, subject to satisfactory completion of probationary period of two years. Unfurnished Government quarters available at reasonable rent. Cost-of-living allowance at the rate of 35 per cent. of salary, subject to a maximum of £E.15 per month, is at present payable. Outfit allowance of £E.40 is payable on appointment if starting salary does not exceed £E.700 per annum. Free passage on appointment. Strict medical examination. At present no income tax is payable in the Sudan. (£E.1 = £1 0s. 6d.)

Application forms and further information for candidates are obtainable from SUDAN AGENT IN LONDON, Wellington House, Buckingham Gate, London, S.W.1. Please mark envelopes "Coppersmith."

RAILWAY SUPPLY FIRM, LONDON, has vacancy for Commercial Engineer. Railway engineering experience desirable. Age 30-40. Apply Box 94, *The Railway Gazette*, 33, Tothill Street, Westminster, S.W.1.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. *Price* 20s. *By post* 20s. 6d.

FIRST PRINCIPLES OF RAILWAY SIGNALLING. By C. B. Byles. Most treatises on railway signalling are intended for the railway signal engineer, but this is an elementary treatise. Cloth. 7½ in. by 5 in. 146 pp. Illustrated. 4s. *By post* 4s. 3d.

A NATIONAL TRANSPORT PROGRAMME. With foreword by Sir James Milne. Outlines the approach of a long-term plan for transport, covering State and private ownership; track costs, etc. Paper, 8½ in. by 5½ in. 27 pp. 1s. *By post* 1s. 2d.

PLASTICS IN RAILWAY ENGINEERING. By T. Lovatt Williams and D. Warburton Brown. 1s. *By post* 1s. 2d.

Railways & Harbours Administration. This contract follows on recent contracts placed by the South African Railways with the North British Locomotive Co. Ltd., to build 160 4-8-2 "15F" class locomotives, and 50 4-8-2 "19D" class locomotives. A large number of these engines and tenders has been delivered already to South Africa.

Collision at Ilford, L.N.E.R.—A collision occurred at Ilford Station, L.N.E.R., on April 11 between a train from Liverpool Street to Southend and a local train. No passengers were injured, but all four lines at this point were blocked temporarily.

Transport Co-ordination in Hyderabad.—Lt.-Colonel E. W. Slaughter, Managing Director of the Nizam's State Railway, will present a paper on "The co-ordination of road, rail, and air services in Hyderabad State, India—experience in the field of British transport vehicles and control of state-owned transport under one administration" before members of the Institute of Transport, at the Royal Society of Arts, Adelphi, London, W.C.2, at 5.30 p.m. on Thursday, May 8.

London Transport New Works.—Speaking at a luncheon of the Southall Chamber of Commerce on April 14, Mr. J. H. Brebner, Chief Public Relations & Publicity Officer, London Transport, said that the eastern extension of the Central Line would be opened to Leytonstone on May 5. The arrangements would allow for 550 trains a day, with a 2-min. service in the peak hours. Work had begun on eliminating the present intersection of up and down tracks at Preston Road and Harrow-on-the-Hill, Metropolitan Line. About seven miles of track would be relaid. It was hoped to undertake extensive improvements to the Metropolitan and Central Line stations at Liverpool Street at the end of the year. Fluorescent lighting would be installed at several additional stations.

Repairs Completed to Woodhead Tunnel, L.N.E.R.—Both bores of the Woodhead Tunnel, on the L.N.E.R. Manchester—Sheffield main line, have been in use again since April 9. Repairs were put in hand on August 26, 1946, the bores being dealt with alternately, so that only one at a time was available for traffic. Restoration of normal double-line facilities through the tunnel has permitted various trains which previously started or terminated at Sheffield, to run to and from Manchester in their normal booked timings. Among those affected are the 3.50 p.m. Manchester to Marylebone, and the 3.20 p.m. Marylebone to Manchester. An application by the L.N.E.R. for Parliamentary powers to build a new tunnel at Woodhead is dealt with in an editorial note this week.

National Plastics Deal Completed.—At an extraordinary general meeting of Thomas De La Rue & Co. Ltd. on February 5, which was reported in our March 14 issue, Mr. B. C. Westall, Chairman, said that the company had been negotiating for the sale of its plastic moulding section, De La Rue Plastics Limited, and that the negotiations had reached an advanced stage. Now it is announced that negotiations between Thomas De La Rue & Co. Ltd. and National Plastics Limited have been completed, and that De La Rue Plastics has changed its name to British Moulded Plastics Limited. Scottish Plastics Limited and Lanarkite Limited, formerly subsidiaries of De La Rue Plastics, now will become subsidiaries of British Moulded Plastics Limited. An offer has been made to the shareholders of Moulded Products Limited to acquire their shares.

Associated Electrical Industries Limited.—The report for the year ended December 31, 1946, shows a net profit of £1,096,046, an increase of £553,229. Adding the sum of £335,800 brought forward from last year, the balance available for appropriation is £1,431,846. During the fuel crisis and switch-off in electrical power, the company continued paying those of its employees who were thrown out of work for this reason at the rate of 34 hr. a week. The directors accordingly have appropriated £275,000 (after tax) to a fuel crisis reserve. The transfer to general reserve is increased from £150,000 to £200,000. An interim dividend of 5 per cent. (less income tax at 9s. in the £) was paid on the ordinary stock on October 7 last year. The board proposes a final ordinary dividend of 7½ per cent. (less income tax) together with a bonus on the ordinary stock of 2½ per cent. (less income tax); the total ordinary distribution, therefore, will be raised from 10 per cent. to 15 per cent., but the report points out that the return to stockholders of the £6,000,000 ordinary share capital at 15 per cent. is slightly less than 5 per cent. on the invested capital. During the year, Vickers Limited acquired a shareholding, thereby renewing a long association with the company. The Deputy-Chairman of Vickers Limited, Lt.-General Sir Ronald Weeks, has been appointed to the board. The annual general meeting will be held at the Connaught Rooms, Kingsway, W.C.2, at 11.30 a.m. on April 23.

Metropolitan Assented Stock.—A statement from Glyn Mills & Co., trustee for the Metropolitan Assented stock, has clarified the position resulting from the provisions of the new Transport Bill. Under the terms of the Bill, no new stock in replacement of the Metropolitan Assented stock will be issued. The £4,414,819 of London Passenger Transport "C" stock held by Glyn Mills & Co. as trustee will be exchanged for an amount of British Transport stock which, at the date of issue, will be of a value of £2,966,206, representing approximately £45 7s. per £100 nominal of Metropolitan Assented stock. The British Transport stock will be held on the same trusts as the present "C" stock. To the extent that interest on the British Transport stock is not sufficient for the purpose, Glyn Mills & Co., as trustee, will be entitled to call on the British Transport Commission to make up the full guaranteed rate of interest on the Metropolitan Assented stock. On December 31, 1958, the British Transport stock will be distributable among the holders of Metropolitan Assented stock.

Forthcoming Meetings

April 25 (*Fri.*).—The Institution of Transport (Metropolitan Graduate & Student Society), at Livingstone House, Broadway, S.W.1. 5.30 p.m. Annual general meeting and an exhibition of Southern Railway films.

April 25 (*Fri.*).—The Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1. 5.30 p.m. "Stress Concentration and Fatigue Failures," by Professor S. Timoshenko, of California, U.S.A.

Railway Stock Market

Removal of Budget uncertainties led to expansion of business in stock markets, and values in most sections were stimulated by the upward trend in British Funds. The latter reflected Mr. Dalton's latest defence of his cheaper money policy, and with gilt-edged governing the yield structure of markets, leading industrial shares generally were higher where changed. There has been a tendency again to favour shares of companies playing an important part in export markets, but generally demand increased although it appeared to be more selective than at the beginning of the year. It is realised that the fuel and other shortages must affect the earnings of a large number of companies.

Iron and steels were again inclined to strengthen, buyers being attracted by the good yields on leaders in this section, including United Steel, Dorman Long, Guest Keen, etc., and Stewarts and Lloyds have remained firm, partly on higher dividend possibilities. Colvilles became firmer on further consideration of the results and big increase in profits.

The pre-Budget strength of British Funds was attributed in part to suggestions that special income-tax concessions might be made in respect of gilt-edged stocks, although this was not generally considered probable. Tax concessions of this kind would be tantamount to raising interest rates and in this respect out of line with the cheaper money policy, although they would probably act as a strong stimulus in moving British Funds to higher price levels. A point apparently overlooked in this connection was that any tax or other concession conferred on British Funds would be a bull point for home rails in view of the fact that they are to be exchanged into the proposed National Transport stock on the terms contained in the Transport Bill.

Apart from considerations of this kind, however, there is no reason why virtually all home railway stocks should not stand at higher levels, current market prices still being well below the "take-over" prices. In financial circles the attractions offered by home rails as a means of acquiring an interest in gilt-edged stocks are generally realised, but although the volume of business has tended to increase, the public generally does not seem attracted. This is no doubt because of a disinclination to favour securities of companies virtually in the grip of nationalisation.

Nevertheless, it would seem that the merits of home rails as a means of acquiring an interest in gilt-edged stocks are likely to become more generally recognised by the public. Generally the disposition still has been to favour prior-charge and senior preference stocks, a number of which have recorded fractional gains on balance for the week. Nevertheless, as has been pointed out in these notes, in view of the "take-over" terms and ultimate exchange into British Transport stock, there is now in effect little distinction between prior charge and junior home railway stocks; and in some instances the junior stocks at current levels seem slightly undervalued in relation to senior stocks.

There has been better demand for Great Western ordinary, which strengthened to 55¼, and L.N.E.R. second preference has been steady at 27. L.M.S.R. 4 per cent. guaranteed attracted rather more attention, and Great Western and Southern preference stocks and debentures recorded moderate gains, although generally home rails have recorded little response to the sharp rally in British Funds. The same applies to other nationalisation securities, including colliery shares. A sharp rise in Cable & Wireless ordinary stock was attributed to the assumption that liquidation may be proposed in preference to continuing in being as an investment trust. London Transport "A" and "B" stocks moved slightly higher, but the "C" stock was virtually the same as a week ago.

There has been less business in foreign rails, the tendency in the Argentine section being to await news of the take-over terms in respect of the different classes of stocks, and as to Brazil stocks, news is awaited as to the progress of discussions still said to centre on outright purchase of the railways.

Central Uruguay issues also quietened down despite the news of a mission which is expected to discuss the purchase of the British-owned railways. Canadian Pacifics receded on the official statement indicating the necessity of higher freight rates. In other directions Antofagasta, after easing, attracted buyers and strengthened to 13¾, but fewer dealings were recorded in United of Havana 1906 debentures.

SCINDE PUNJAUB & DELHI RAILWAY ANNUITIES.—It was notified recently that, on December 31, 1946, a total sum of £4,240,482 14s. 7d. was invested for the purpose of providing a sinking fund in respect of the annuities, class "B."

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1945/6	No. of Week	Aggregate traffics to date: Totals 1946/7	Aggregate traffics to date: Totals 1945/6	Aggregate traffics to date: Increase or decrease	Shares or Stock	Prices: Highest 1945	Prices: Lowest 1945	Prices: Apr. 15, 1947
				£	£		£	£	£				
South & Central America	Antofagasta	834	6.4.47	31,050	+ 5,010	14	516,880	462,720	+ 54,160	Ord. Stk.	12	8¾	14
	Arg. N.E.	753	5.4.47	ps.301,200	+ps.40,200	40	ps.12,788,200	ps.11,784,300	+ps.1,003,900	,,	10	5½	16
	Bolivar	174	Mar., 1947	$111,635	− $12,317	13	$340,312	$356,403	− $16,091	6 p.c. Deb.	8¼	5½	7½
	Brazil	—	—	—	—	—	—	—	—	Bonds	25	17	37
	B.A. Pacific	2,771	5.4.47	ps.2,970,000	+ps.513,000	40	ps.95,127,000	ps. 91,061,000	+ps.4,066,000	Ord. Stk.	7	5	10
	B.A.G.S.	5,080	5.4.47	ps.3,761,000	−ps.741,000	40	ps.145,557,000	ps.143,032,000	+ ps.2,525.000	Ord. Stk.	13¾	10½	18
	B.A. Western...	1,924	5.4.47	ps.1,363,000	+ps.132,000	40	ps.52,511,000	ps.48,083,000	+ ps.4,428,000	,,	12¾	9½	28
	Cent. Argentine	3,700	5.4.47	ps.3,370,820	−ps. 23,818	40	ps.129,261,580	ps.126,420,315	+ ps.2,841,265	,,	9¾	7	20
	Do.	—	—	—	—	—	—	—	—	Dfd.	5	2⅞	17½
	Cent. Uruguay	970	5.4.47	27,609	− 9,165	40	1,481,934	1,558,397	− 76,463	Ord. Stk.	7½	4	25½
	Costa Rica	262	Feb., 1947	30,030	+ 3,118	35	220,372	222,104	− 1,732	Stk.	16¼	13	12½
	Dorada	70	Feb., 1947	29,600	+ 1,535	8	60,300	59,814	+ 486	1 Mt. Deb.	103	102	106½
	Entre Rios	808	5.4.47	ps.395,800	−ps.23,100	40	ps.17,239,000	ps.17,014,800	+ ps.224,200	Ord. Stk.	7½	4½	8
	G.W. of Brazil	1,030	5.4.47	30,600	+ 1,600	14	524,300	440,800	+ 83,500	Ord. Stk.	30/-	23/6	95/-
	Inter. Ctl. Amer.	794	Feb., 1947	$1,145,853	+ $146,184	8	$2,327,261	$1,924,216	+ $403,045	—	—	—	—
	La Guaira	22¾	Mar., 1947	$130,008	+ $18,378	13	$355,075	$347,692	+ $7,383	5 p.c. Deb.	78	70	80
	Leopoldina	1,9 8	5.4.47	75,459	+ 19,774	14	887,526	782,502	+ 105,024	Ord. Stk.	4½	3½	19½
	Mexican	483	31.5.46	ps.1,464,000	+ps.459,100	22	ps.7,706,200	ps.13,441,600	+ps.5,220,200	Ord. Stk.	¼	¼	1
	Midland Uruguay	319	Feb., 1947	7,529	− 6,268	34	132,490	148,286	− 15,796	—	—	—	—
	Nitrate	382	31.3.47	10,788	+ 1,285	13	49,326	57,202	− 7,876	Ord. Sh.	75/6	67/6	81/3
	N.W. of Uruguay	113	Feb., 1947	3,067	− 811	35	42,607	44,696	− 2,089	—	—	—	—
	Paraguay Cent.	274	4.4.47	£61,459	+ £7,065	36	£2,529,714	£2,410,293	+ £119,421	Pr.Li.Stk.	79¾	77	60½
	Peru Corp.	1,059	Mar., 1947	155,079	+ 36,693	39	1,356,614	1,252,842	+ 103,772	Pref.	10¾	7¾	11¾
	Salvador	100	Feb., 1947	c244,000	+ c11,000	35	c1,129,000	c1,080,000	+ c49,000	—	—	—	—
	San Paulo	153½	—	—	—	—	—	—	—	Ord. Stk.	60¾	50½	177
	Taltal	156	Mar., 1947	2,925	− 605	39	37,630	28,020	+ 9,610	Ord. Sh.	17/-	10/6	22/-
	United of Havana	1,301	6.4.47	116,901	+ 8,024	40	2,444,517	2,279,682	+ 164,835	Ord. Stk.	3	1	4
	Uruguay Northern	73	Feb., 1947	837	− 764	34	9,953	14,214	− 4,261	—	—	—	—
Canada	Canadian National	23,535	Feb., 1947	7,767,000	+ 553,250	8	15,981,500	14,939,000	+ 1,042,500	—	—	—	—
	Canadian Pacific	17,037	7.4.47	1,486,750	+ 188,750	14	19,324,000	19,088,250	+ 235,750	Ord. Stk.	24	14⅜	16⅛
Various	Barsi Light†	202	Jan., 1947	21,292	− 1,492	43	225,870	225,120	+ 750	Ord. Stk.	131	123	106½
	Beira	204	Jan., 1947	86,519	+ 14,290	16	355,672	286,482	+ 69,190	—	—	—	—
	Egyptian Delta	607	28.2.47	13,965	+ 657	48	618,441	578,317	+ 40,124	Prf. Sh.	10	8¼	6½
	Manila	—	—	—	—	—	—	—	—	B. Deb.	71	55¼	71½
	Mid. of W. Australia	277	Feb., 1947	15,318	− 540	34	130,669	134,118	− 3,449	Inc. Deb.	97¼	85	65
	Nigeria	1,900	Feb., 1947	353,073	+ 2,154	46	4,193,473	3,153,983	+ 1,039,490	—	—	—	—
	Rhodesia	2,445	Jan., 1947	557,398	+ 66,020	16	2,227,423	2,009,946	+ 217,457	—	—	—	—
	South African	13,323	8.3.47	1,292,031	+ 178,357	49	56,867,061	49,975,966	+ 6,891,095	—	—	—	—
	Victoria	4,774	Nov., 1946	1,204,525	− 39,782	—	—	—	—	—	—	—	—

† Receipts are calculated @ 1s. 6d. to the rupee